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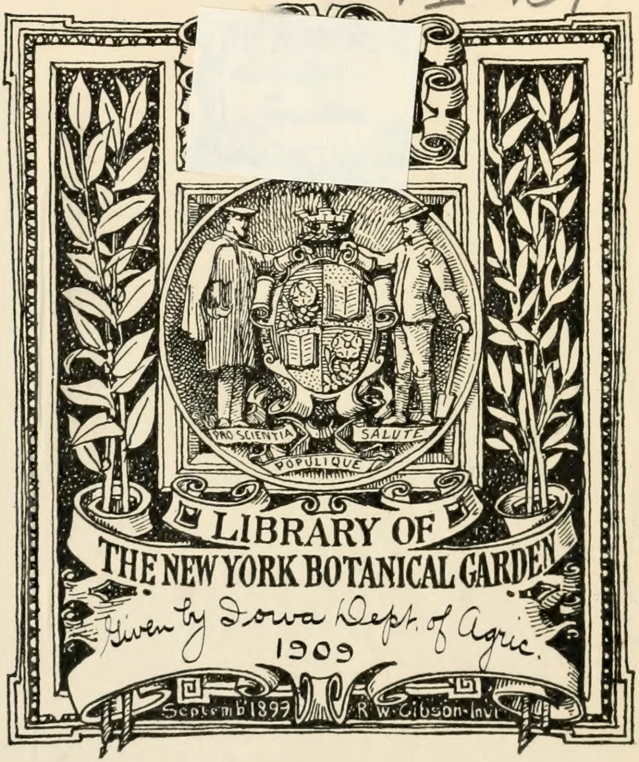
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SIXTH ANNUAL

Iowa Year Book of Agriculture

Issued by the

Iowa Department of Agriculture

1905

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PREFACE.

NOTE:—This yearbook should have been received from the State Printer, ready for distribution, by June 1, 1906. The delay has been caused by the large amount of extra work ordered by the last General Assembly, and the printers strike. No blame can be attached to the office of the Department of Agriculture for the delay, the copy for the book having been ready since January 16, 1906....................J. C. Simpson, Secretary.

The Iowa Year book of Agriculture is published by the State Department of Agriculture, and is for free distribution. The book can not be published until after the close of the calendar year, for the reason that it contains information, statistics, etc., which are not available until after that time.

The present volume includes the papers and discussions presented at the State Farmers' Institute meeting, proceedings of the Agricultural Convention and synopsis of the proceedings of the State Board of Agriculture and committee meetings during the year of 1905; statistics of farm crops and a review of the weather conditions and rain fall for the year; statistics on live stock, farm crops, farm acreage and other information complied from the state census report of 1905; proceedings of the annual meetings of the Improved Stock Breeders', Iowa Swine Breeders', and Iowa State Dairy associations; statistics and other information complied from the Dairy Commissioners' report; report of Pure Food Committee on the adulteration of foods, etc., and proposed legislation to regulate same; some papers read before county farmers' institutes, with articles from different sources on agriculture, and kindred subjects, of interest to the farmer; reports from county and district agricultural societies in the state receiving state aid, with statement of their finances as reported on November 1st; together with a directory of societies, associations and organizations representing agricultural interests in Iowa and other states.

J. C. Simpson, Secretary State Board of Agriculture and
Editor Iowa Year Book of Agriculture.

Des Moines, Iowa. January 16, 1906.

APR 13 1909

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LETTER OF TRANSMITTAL.

OFFICE OF
IOWA STATE DEPARTMENT OF AGRICULTURE,
CAPITOL BUILDING.

DES MOINES, IOWA, JANUARY 16, 1906.

To His Excellency, A. B. Cummins, Governor of Iowa:

I have the honor to transmit herewith the Sixth Annual IOWA YEAR BOOK OF AGRICULTURE, for the year 1905.

Very respectfully,
JOHN C. SIMPSON,
SECRETARY STATE BOARD OF AGRICULTURE.

PART I

STATE FARMERS' INSTITUTE—AGRICULTURAL CONVENTION—SYNOPSIS OF STATE BOARD AND COMMITTEE MEETINGS FOR 1905.

REPORT OF COMMITTEE ON ADULTERATION OF FOOD, ETC. LEGISLATION RECOMMENDED AND ENACTED BY THIRTY-FIRST GENERAL ASSEMBLY.

REPORT OF SECRETARY

REPORT OF THE PROCEEDINGS OF THE IOWA STATE FARMERS' INSTITUTE, HELD IN THE ROOMS OF THE DEPARTMENT OF AGRICULTRE, IN THE CAPITOL BUILDING, DES MOINES, IOWA, ON DECEMBER 12-13, 1905.

FORENOON SESSION

December 12, 10:00 A. M.

President Morrow of the State Board of Agriculture in the chair.

THE PRESIDENT: Gentlemen, you will please come to order. We will first listen to the address of welcome, by Harvey Ingham, editor of the Register and Leader, of this city.*

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* Owing to the inability of the shorthand reporter to report the address of Mr. Ingham, we are unable to include it in the report. This we regret very much, as the address was an able one, and well received by those in attendance at the meeting. EDITOR

THE PRESIDENT: The first paper upon the Program is entitled, "Preparation of the Seed Bed for Planting of Corn," by Jas. Atkinson, Editor of "The Homestead."

PREPARATION OF THE SEED BED FOR PLANTING CORN.

JAMES ATKINSON, DES MOINES, IOWA.

The character of a soil has much to do with the method employed in preparing a seed bed for corn. There is not time on this occasion to take up and discuss the different kinds of soil, so that I shall have in mind just the average corn land of the state, most of which is somewhat loamy in its nature.

Taking first a soil that has been fall plowed, it is an excellent practice to harrow the surface of such land just as early as possible in the spring. This breaks the hard crust and prepares, as it were, a seed bed for weeds. In other words, it favors to the greatest possible extent weed germination, while in addition it tends to conserve moisture which may be highly useful later in the year. It is true that during the last three years we have had more rainfall than was desirable, but, generally speaking, culture methods that are used to conserve moisture are not far out even should heavy rainfalls prevail. Under some circumstances it may pay to harrow fall plowed land more than once. By the first of May weeds are generally starting, and if not showing through they are at least sprouting. This is the ideal time to bring about their complete destruction, and I know of no method by which this can be so well done as by the use of the disc. Whether the land is firm or mellow, the practice of double discing, lapping half the disc each time, is much to be preferred to that of giving a single stroke. Even though the surface soil is thoroughly cut by one discing one can hardly ever completely harrow down the ridges and furrows made by one discing. After making a thorough job of disking the harrow should be used once or twice. This shakes apart all root clumps, and it also brings about what might be called a firm, fine seed bed. So much the better if the planters can be put on immediately after harrowing, and just as soon as possible after the soil is disced. This gives the corn an opportunity to make a strong start before the weeds come on. I am a strong believer in bringing about as much weed destruction as possible while it may be done with four good horses on a disc, and the method I have described is almost ideal in this respect.

In the case of stalk ground that must be spring plowed I strongly favor the practice of discing as early as possible in the spring. Usually it will pay to double disc. I have recently had it called to my attention that better work can be done by discing diagonally across the field than can be accomplished in any other way, but I simply speak of this for your benefit, though not from experience. It appeals to me as being exceedingly practicable. If stalks have been thoroughly pastured usually double discing will cut them up sufficiently so that they will plow under and never give further trouble. Unless this can be done I would have no hesitation in burning them, because they may cause a great deal of annoyance, not only in planting, but in cultivating the crop afterwards, and in this way do much more harm than they could possibly do good by such addition of vegetable matter to the soil as will be made.

After discing the soil it must be plowed of course, and not necessarily very deep, four or five inches being sufficient. Where you have plenty of horse power on your riding plow you will find it an excellent plan to attach a small harrow—one wide enough to cover two furrows. In this way you can really leave your land not only plowed but harrowed twice. This is specially desirable if the soil is wet and inclined to bake, because if such a soil is not harrowed soon after being plowed the chances are that it will be exceedingly difficult to make a friable seed bed. It is not a difficult mater to temporize a mechanical device that will handle a small harrow of this character.

Where spring plowing is done early I think it usually pays well to disc the soil just before planting. Of course this means a good deal of work because it must again be harrowed. Nevertheless I think the destruction of weeds that is wrought makes the labor very profitable. In every operation, whether it be plowing, discing or harrowing, I think it is important that one should keep in mind the question of making the surface as level as possible, so that the seed will all be planted a uniform depth. The more I study this question the more I am convinced that it will pay to use a heavy plank float so that the high places will be worn off and the low places filled. If we go to the trouble to test our seed and planters so as to insure a uniform drop in every hill, why not in our culture methods prepare the soil so that every hill will be uniformly covered?

Generally speaking, there is considerable advantage where it is the intention to put corn on sod ground if plowing is done in the fall. Of course this cannot always be done, owing to the fact that it is frequently necessary to wait until spring in order to determine how new meadows come through the winter. By fall plowing sod one can lessen labor at the very busiest time of year. Fall plowed sod works down and makes a better seed bed than can be made in the spring, especially where timothy or blue grass predominates, so that the surface sward is tough. Clover land is always more or less friable, and it is not difficult to make a good seed bed even on spring plowing. Insects are generally plentiful on sod ground, though their number is greatly lessened on fall plowing. This not only destroys a great many cut-worms but it also disturbs wire-worms at a critical time in their life history. Whether on fall or spring plowing, it will always pay to do a good deal of work on the surface in the spring on sod ground. There is always more or less hollowness under the furrows and enough work should be done on the surface so that the furrow slice becomes thoroughly compacted with the lower soil. Where this is done there is not the same danger of the crop being injured by drouth as will be the case where the seed bed is prepared somewhat roughly. To bring about the ideal condition on such land there is nothing better than to alternate the harrow and the disc. This thoroughly cuts the grass, while the harrow not only fines the surface but tends to make the soil firm.

Speaking of the harrow, it is my opinion that this is an implement that is not used enough. It is not an attractive job where one has to walk and because of this, I have found it profitable to equip my harrow with a riding cart. Four horses on a 16-foot harrow, with a sensible man on the seat, can do an immense amount of good in a day. At no time is its use more to be commended than just before the corn is planted. At such a time I firmly believe in setting the teeth somewhat straight so that the surface soil is thoroughly stirred, and consequently all weeds destroyed in their infancy.

THE PRESIDENT: The paper is now open for discussion.

A MEMBER: What is the object in discing the soil before plowing?

MR. ATKINSON: I always feel you make a better connection between the soil that is loose and that which is not turned over. I think the surface soil will work down and make a firmer and more pliable seed bed.

A MEMBER: Have you reference more particularly to corn stalk land?

MR. ATKINSON: Well now, the small grain land, I would have plowed in the fall. I take it for granted that every man who is here who does not seed down his land, but who intends to put his corn on grain land, does fall plowing. I think, by doing that you will be able to produce more bushels to the acre than otherwise. That is the reason I spoke about fall plowed land.

A MEMBER: Don't you think discing this land in the spring would have a tendency to cut the stalks up so they wouldn't bother a great deal?

MR. ATKINSON: That is one of the uses. I said, where stalks are freely pastured, two discings will invariably get them out of the way of the corn planter and cultivator. Someone who has had experience along that line might say something on the subject.

MR. ADAMS, of Humboldt County: I thought the paper a very practical one. I think most of it contained the salt and pepper of common sense. But I cannot help but take exceptions to one or two ideas advanced. The first was in regard to the float, as being practical in some parts of Iowa. I don't know much about Iowa outside of my own county. I have tried the float in years gone by. You take it in a dry season, Mr. President and Members, and the float makes a dust coat. You know we have very high winds in Iowa, and if it is dry, that surface soil goes away in dust; and on account of that blowing dust, which invariably raises in a dry spring, after the use of the float, I have discarded it.

I prefer also spring plowing for my sod. My reasons for it are, I put in my sod corn later, it matures quicker, and it will ripen from 8 to 10 days earlier than that put in on ground already kept in corn and small grain. My reason for plowing my sod in the spring as late as I can is, that I want a growth of grass—you are aware of the manurial value of grass, which is considerable; then I disc thoroughly and do not plant until after the first or tenth day of June. You almost invariably get a good stand of corn if the seed is right, and the cut worn will not bother it because it is too late in the season for that.

Mr. Adair, of Bulter County: Mr. President, I should have to antagonize the remarks of my brother concerning fall and spring plowing of clover sod. I have been "monkeying" with this clover business ever since Uncle Henry Wallace commenced preaching the Gospel of Clover in Iowa in the Iowa Homestead, many years ago. My experience is that fall plowing is the thing for sod. The way we do on our farm, is not to wait until the first or tenth of June, but plant as early in May as the conditions will permit. We disc it in the spring. To give you results, this last spring we had 100 acres of clover sod,—and we will have the same next spring—we disced that over and finished it on the 4th day of May, and after we had harrowed it, we had a down-pour of rain, a very heavy rain-fall, and it run the ground all together again, seemed to settle it down. We put the disc on again and double disced it, that is, lapped it one-half, as Mr. Atkinson spoke of. The result was, that corn yielded an average of over 80 bushels per acre; and one acre of land I bought in 1899, for $35.00 an acre, produced the enormous crop of 117 bushels, and it was from seed corn that we had grown on the place and in the neighborhood.

Now, it is results that the farmers are after. Of course, we have our different ideas; but my observation has been that the cut worms do bother until sometimes up to the 20th of June. They have bothered us in years gone by. I think this is the experience of most of you on this question.

THE PRESIDENT: The next paper is entitled, "The Time to Select Seed Corn, and Care of Same," by Hon. John Cownie.

Prefatory to reading his paper, Mr. Cownie said:

When I was invited by the Secretary of the State Board of Agriculture to prepare a paper on the care of seed corn, I was only too well pleased to accept the invitation. This subject has been discussed of late years, and more attention has been given to it than I have known in all my residence in Iowa, and I am pleased to know that at least some interest is being taken in this most vital subject. But at the same time, so much has been written in regard to it that has been erroneous, that a great deal of good that otherwise would have been done has not resulted. Newspaper reporters who never did a day's work on the farm and who know nothing whatever of the actual conditions, get a few inklings from attending addresses, and they write great, long articles upon the subject which have no semblance to truthfulness whatever; not a particle. Although our reporters are no worse than those of other states, only a year ago, a reporter whose name and reputation is world-wide, representing one of the Chicago papers, came into Iowa to deliver a course of lectures, and incidentally to write his impressions of the state in his paper. He had been at Shenandoah. I suppose some farmer told him this, and he wrote it up. The substance of it was, that a great discovery had been made in Iowa; that heretofore, the farmers had been cutting their clover and timothy for hay, but of late years, they were saving all their timothy for seed, for the reason that they found the hay was equally as good after the seed was taken out as it would be to leave it in and mow it at the proper time. He gave all the reasons for this, and I have no doubt, some farmer gave him the thought. You and I, who have raised timothy seed and threshed it, and put up clover and timothy hay in the early part of July, know better. There isn't a cow in the state of Iowa that would believe such nonsense; there isn't a six months old calf but what knows better.

Now, if our people who don't know anything about this subject, would just keep their mouth shut, and let those who have had some practical experience with it do the speaking, they might have results. As it is, they befog the whole subject. The result is, the farmer who hasn't given the subject much thought, the young and inexperienced farmer, doesn't know what to do. It may sound egotistical, but I want to say, I know all there is to be known about this; I have been through the mill. One year I lost over $2000 on account of poor seed corn. We planted it three times; and yet that corn was sound and dry, and apparently well matured when I saved it in the fall. But I had adopted a new method of caring for it in the winter. I was a boy at that time and didn't know anything at all about corn. But there were farmers living in the neighborhood who suggested that we gather our seed corn in the fall that year. There was no floor on the upper part of the house, which gave a fine chance for strips; one room was kept for a kitchen and the other for a bed room, and keeping fire day and night, that corn grew. We continued that method for a good many years. After a while we had a little of the worldly goods, and building a little better house, my better half suggested we would not take the corn in the new house; that wouldn't do; that was too good for corn. But we had the old house, and we had always gathered the corn as usual, but there was one essential lacking; there was no fire there. When that corn was taken out in the spring, there was not two-thirds of it that grew; that was my second lesson. I have paid for my experience.

I would be willing to enter into a contract to deliver all the corn that would be needed for farmers in Iowa, if I had the facilities, and guarantee one hundred per cent for germination each and every year, I don't care what the weather is. I have been, as I said, through the mill; have had all the experience in trying to keep it. With the method I shall outline in this paper, there will be no difficulty. You can secure your corn, do your planting in the full assurance that every grain will germinate a strong and healthy stalk.

CORN, SELECTION OF SEED, PLANTING AND CULTIVATION.

JOHN COWNIE, DES MOINES, IA.

The interest that is now being taken in our great staple, corn, is to me particularly gratifying, as it proves that the farmers of the middle states are beginning to realize that the enormous losses sustained by the use of poor seed and slovenly methods of planting and cultivation are altogether unnecesary. I repeat, that the farmers are *beginning* to realize the amount of their annual losses, for it is apparent to every one familiar with the conditions as they actually exist that little progress has yet been made in securing good seed, the first essential to a good corn crop.

Our State Agricultural College, realizing the importance of good seed corn, is doing a grand work in its endeavor to educate the farmers of the state to a proper selection of seed corn. But unfortunately the instruction has been given at a season of the year when it was impossible to secure good seed, and the agitation of the subject has brought to the front many writers and speakers who were mere theorists without practical experience, and their injudicious advice has done incalculable injury in retarding the saving of seed corn in a proper manner.

The selection of seed corn in the winter or spring is a fallacy that should be condemned before any real progress can be made, and the selection of seed corn from a crib, the numbering of the ears, and the testing of the kernels in moistened blotting paper or newspapers is so radically wrong, and so contrary to correct methods, that it is not surprising that so little real progress in securing a full stand of corn by one planting has been accomplished. I have often seen corn germinate when tested in moistened paper or in wet cloths, and to all appearances both root and stalk were all that could be desired. But planted in earth, with natural conditions, there was not sufficient vitality in the kernel to produce a stalk with power enough to come through the ground, and a careful examination showed that both root and stalk had given up the struggle for lack of support from the weakened kernel. This explains the reason for so much disappointment in corn failing to grow in the field when the test with the moistened paper or damp sawdust had shown good germination.

But even if corn selected from the crib in the winter or spring has sufficient vitality to grow in the field, the stalks will be weak and spindling, in striking contrast with the strong, vigorous growth of seed corn secured in a proper manner. In addition to a strong vigorous growth, the carefully kept seed corn, full of life and vitality, will germinate much sooner than the corn of weakened vitality, and growth is also more rapid. All this is so well known to those who have had practical experience in testing corn in this manner, and who are close observers of the conditions as they actually exist, that the mere statement of these facts should convince every farmer that there is but one right way to save seed corn, and if this method is not followed, loss is inevitable.

As an object lesson from a cartoon, I cannot imagine a better subject than the picture of a shiftless farmer selecting his seed corn from the crib in the spring, the ears lined up on a table in front of him, and with note book and pencil, he is listing every ear and kernel, for a test that has no semblance whatever to natural conditions. The next picture would show the same farmer examining the dainty little germs emanating from the kernels, as the moistened newspaper is unfolded and his smile should be large and broad, thus giving expression to the joy he feels in making such a fine selection of seed corn.

The next picture in the series would show the same farmer, about ten days after planting his corn, in the field, upon his knees scratching with all his might, and with both hands, and wondering why that carefully selected and duly tested seed corn had failed to grow. And as he looks around and sees the scattered stalks one and two in a hill, with many blanks, his face would lengthen as he looked upon the few tiny stalks, when he had expected a full stand and a strong, vigorous growth.

The last picture would show the same farmer explaining to his neighbors the reason for the poor stand, the planter did not work well, he planted the corn too deep, the weather was too cold, or it was too wet, or perhaps it was too dry, and he did not run the planter deep enough, any or every excuse, for his own carelessness in neglecting to secure his seed corn in a proper manner.

The next cartoon would show a farmer taking down the ears from racks in a room or attic over his kitchen, with a large register in the floor over the cooking range, to allow all the vapors and heat to ascend to the room above, and thus secure good ventilation for the kitchen, while at the same time furnishing ideal conditions for drying and preserving seed corn in the ear from October 1st to the planting season. I would show the farmer examining every ear carefully and rejecting any that might have molded or shown other imperfection.

The next picture would show this farmer removing the butt and tip kernels from the ear, reserving only the uniform sized kernels for seed, and after carefully shelling the corn, I would show him as he adjusted the seed plates on his planter to drop three kernels, neither more nor less, at each stroke of the checkrower.

The next picture in this series would not show this farmer on his knees in the corn field, scratching with all his might, or calling on his neighbors for seed corn to replant his field, and giving all manner of excuses for the failure of his corn to grow but it would show him with his cultivator in the field, with an almost perfect stand of corn, strong and vigorous stalks, and the assurance of a good growth and a full crop.

These pictures are certainly not overdrawn, but are true to life, as I have seen them often in my forty-nine years experience on an Iowa farm.

While we had in round numbers 9,000,000 acres of corn in Iowa the present year, there is no question now, among those who have personal knowledge and practical experience in corn culture, that all the corn stalks produced in Iowa in 1905, if evenly distributed, could have been placed on 7,000,000 acres and there would not have been to exceed three stalks to each hill.

This condition means a loss of 2,000,000 acres, and at thirty-three (33) bushels an acre, we have 66,000,000 bushels of corn lost to the farmers of Iowa, the greater part on account of poor seed corn last spring. At thirty-two cents (32c) per bushel, which is about the present average price, we have the enormous loss of $21,120,000 that with more favorable conditions would have been added to the wealth of the state.

In the face of these facts, that cannot be successfully denied, no excuse need be made for writing this paper, and again calling attention to the importance of securing seed corn at the right time and caring for it in a proper manner, until the planting season the following year.

I am aware that there is a difference of opinion, even among the limited number of farmers who make it a rule to gather their seed corn as soon as it is fit for seed, as to the proper method of caring for it, but an experience of forty-nine years with close observation has convinced me that while there are many different methods practiced, there is only one method that never fails, and which can be depended upon to germinate 100 per cent. in the field, in the corn planting season.

A common method is to gather seed corn early in the season, and hang it under a porch or in a driveway with a roof over it, or in a shed, sometimes a wire is stretched between two trees and the ears being tied in pairs by the husks, are hung over the wire. The objection to all these methods is the fact that the corn will absorb moisture from the atmosphere during moist weather, which retards the drying process so essential at this period. Other methods will suggest themselves, such as burying the seed corn in the oats bin, hanging it in the barn or granary, or some other outbuilding, placing it in the cellar where it would be safe from the frost, but I have known failure to result from each and every one of these methods.

The only method that I know, whereby seed corn can be saved and depended upon to germinate 100 per cent in every season, and with the most adverse conditions of cold and wet weather in the planting season, is to secure it in the last half of September or the first half of October, according to the advancement of the season, and the maturity of the corn. The best ears should be selected and stripped of the husk, leaving only sufficient husks to tie the ears in pairs, or the husks can be entirely removed, and the ears laid on racks not more than two or three ears in depth and in such manner that a free circulation of air will be insured. Artificial heat is absolutely necessary to thoroughly dry the corn, and it matters not where this drying process is done, provided the corn is kept dry, and warm air freely circulating through it.

I cannot refrain from entering a most vigorous protest against the altogether too common practice of deferring the selection of seed corn until husking time. While it is true that a good selection can be made when every ear in the field is handled, still this method is fraught with the greatest danger, for in many seasons we have severe freezing weather in November, the temperature often reaching fifteen degress above zero or seventeen below freezing. Only a year or two ago this condition was brought forcibly to mind when those who practiced this method found that the seed corn gathered in the early part of November, and at once placed in a dry, warm room, germinated 100 per cent, while that gathered after the hard freeze, and placed in the same room, proved unfit for seed, germinating, with the same conditions as the corn saved before the cold weather, a fraction over 50 per cent.

When the new State Hospital at Cherokee was opened, there did not appear to be any place for storing seed corn, except in some of the outbuildings. Knowing that there was always more or less risk in keeping seed corn in buildings without artificial heat, I ordered it to be placed on racks in the basement of the building, and close to the steam heating pipes. I was told that the thermometer often indicated 120 degrees in this section of the basement and the corn would be ruined, but with my experience with seed corn I had no fears, and in the test that was made and in the field, not a single kernel of this seed corn failed to germinate.

In a paper which I read a number of years ago at a meeting of the Iowa Improved Stock Breeders' Association on Corn Culture, I advised the storing of seed corn in a room or attic over the kitchen for the reason that there is always fire in the farmer's kitchen in the autumn months, and artificial heat could thus be furnished without cost. In the discussion that followed the reading of the paper, it was stated that mice and rats would be brought into the house and that artificial heat was not essential for drying seed corn. To my personal knowledge, some of the parties who took issue with me on this matter have lost thousands of dollars since then, on account of planting seed corn kept in an outbuilding during the winter. Had my advice been taken at that time by every farmer in the state, Iowa would today be richer than it is by hundreds of millions of dollars.

It is true that unless proper provision is made to guard against rats and mice, these vermin will gain an entrance, but it is an easy matter to prevent them from reaching the corn by either suspending it on strips or laying it on racks set above the floor and the supports covered with tin.

While with all other methods that I have ever heard of, for saving seed corn and which may prove satisfactory for years, there comes a time when they fail; the method here outlined never fails, and there is not a single farmer in the state of Iowa who has followed this method, who ever had to replant a single hill on account of poor seed corn.

The seed corn should remain in the room all winter, and thus receive the benefit of the heat from the cooking stove, and it is better if the temperature of the room is kept above the freezing point at all times. Corn loves heat in the field, and a dry, warm atmosphere is the ideal condition for preserving seed, and the corn should remain on the cob until it is time to get it ready for planting. When removing the tip and butt kernels, every ear should be carefully examined and if there are any indications of mold or other imperfections, the ear should be rejected. When gathering seed corn, three or four times the quantity required should be secured to allow a close inspection, and the rejection of all but the most perfect ears.

Having thus indicated the only method by which seed corn can be successfully saved in Iowa, not some seasons but always, I cannot refrain from calling attention briefly to a few more requisites in securing the best results, even with good seed to begin with. A uniform stand is essential, but this cannot be secured even with the best seed unless the kernels are practically uniform in size and shape. While we reject the tip and butt kernels on account of their size and shape, this is not sufficient, as the kernels on different ears vary in size, and it is impossible to secure uniform dropping unless the kernels are of the same size and shape.

An exhibit at our State Fair for a number of years, and also at the Louisiana Purchase Exposition held at St. Louis last year, that attracted a great deal of attention from farmers especially, was a corn planter in motion, being operated by an electric motor. Beneath the heel of the planter an endless belt revolved, and at every check of the planter three kernels of corn would drop on the belt, and be carried for eight or ten feet, in full view of the onlooker before it fell in the box provided for receiving it, when it dropped from the belt. To all appearances the planter was not different from other corn planters on the market, the only peculiarity being that it dropped unerringly three kernels at every stroke of the checker. To me it was somewhat amusing to hear farmers extol the quality of this corn planter and denounce their own planter that would drop from two to five kernels at each stroke, and the remark was often heard, "I am going to buy one of these planters, for it beats any planter I have ever seen for uniform dropping."

Passing by this exhibit one morning before the crowd gathered I ran my hand through the corn being used and remarked, with a wink at the exhibitor, that the kernels were the most uniform in size I had ever seen. The exhibitor understood, and frankly stated that he passed the corn through and over sieves or riddles about a dozen times until he had secured a half bushel of corn that to use his own language "one kernel did not vary a hair's breadth from the size of the others."

Every farmer can practice the same method, and either by selection by the eye, or the use of sieves of different sizes, kernels of uniform size can be secured, and the seed plates of the planter can then be selected, that will drop uniformly three kernels in each hill.

To secure the best results from the planter the ground must be smooth with a mellow surface, and free from everything that would prevent the planter from running at a uniform depth. A great deal of corn is planted directly after the plow, in the belief that the harrow will do much more efficient work after the planter when the ground is rough than it would do if it were smooth. Of the correctness of this opinion there is no doubt, but as a rule the ground after the plow is rough and uneven, for the art of plowing in a scientific manner, and leaving the surface of the ground smooth and even is still unknown to the great majority of the farmers of America. With the rough and unworkmanlike plowing that is the rule, thorough harrowing is absolutely necessary before planting, to insure a uniform depth of covering, and that the planter may run smoothly and thus insure uniform checking of every hill.

With a rough, uneven surface, much of the corn is dropped on high places and either not covered or covered so slightly that when the harrowing is done, the seed is left exposed on the surface, and consequently lost, for it cannot grow unless covered with sufficient earth to insure germination. There will also be a large part of the corn dropped in hollows and when the ground is harrowed it will be covered too deep. In preparing corn stalk ground for another crop of corn, I have found discing before plowing the ground an excellent method, for with sharp, well polished discs, the stalks are cut better than with a stalk cutter, and the surface left in fine condition for the plow, the horses walking much better than when the stalks are in their way.

The harrowing before planting should not prevent harrowing after, and if the ground is foul the cultivator should follow the planter and then with a thorough harrowing the corn will get the start of the weeds.

Merchants find it necessary to take an inventory of their stock at least once a year that they may determine with accuracy whether their business is making gains or losses. In like manner the farmer who has an eye to business methods should take an inventory of his growing corn every year and this is best done before cultivating begins. To take this inventory a sheet of paper should be prepared in the following manner, placing on the left margin the words—

(Tally as shown, a stroke for each hill.) Total.
"Blank" ....
One ....
Two ....
Three ....
Three ....
Three ....
Four ....
Five ....
Six ....
Total hills in row ....

The count should be taken across the field from the way the planter was driven on at least four different rows, the field divided in about equal spaces, that a good average may be obtained. Where the corn is the proper height, standing straight and stiff, and before the leaves appear, the stalks in each hill can readily be counted as fast as one can walk. All that it is then necessary to do is to attach the sheet of paper mentioned to a board or other article that will hold it smooth, and glancing at each hill tally "1" opposite the proper number on the margin. Thus, if there are three stalks in the hill tally "1" on the same line as the word three, and if a hill is missing tally "1" on the same line as the word blank appears, and in like manner with all the other numbers.

If all the work has been done as indicated in this paper, the great bulk of the tallys will be after the word "Three" and it will be necessary to leave a sufficient number of lines for "Threes" that there may be no crowding of the strokes representing each hill as it is passed. After the inventory has been taken, add together all the tally marks and with a little calculation it is readily determined what per cent. of the field has three stalks to a hill, what per cent. is lost by blanks, the number of ones or twos, fours or more. Having practiced this method of taking an inventory each year of my corn fields, I found it proved a great incentive to still greater effort in securing the ideal condition of three stalks to each and every hill, and without a blank in the field.

The cultivators should be started as soon as possible after planting and whether it shall be shallow or deep cultivation must be determined by the condition of the soil and the weather.

With a mellow soil and favorable weather, shallow cultivation will be indicated, but on foul land and in wet, cold weather, more benefit will be derived from the large shovels run at a good depth. Deep cultivating not only destroys the weeds better than shallow cultivation in wet weather, but it opens up the soil to the rays of the sun and allows the air to penetrate to the roots of the corn, which insures a much better growth than to allow a cold sodden mass of wet soil to lie undisturbed which would be the result of shallow cultivation in wet, cold weather.

In times of extreme drouth, no fears need be entertained in regard to cultivation for the more the surface of the ground is stirred ,the more moist and mellow it will become. In some seasons there is much loss from cut worms, especially on spring plowed sod ground, and in the locality of old straw stacks, that have been allowed to remain in the field.

I have found that fall plowing of sod ground destroys the eggs deposited the previous summer, and from which the cut worms are hatched, the breaking up of the nests and exposure to the frosts of winter, after the ground is plowed, proving an efficient preventive from damage by this pest.

Old straw stacks should not be allowed to occupy valuable ground in the field, but the straw should be used for food or bedding for stock, and when this is not necessary the straw should be used for a top dressing for grass land, where it will decay rapidly, and add to the fertility of the soil, as shown by the increased growth of the grass.

The ground where the straw stack stood should be plowed in the fall to destroy the nests where the eggs containing the embryo cut worms are deposited, for these eggs cannot resist cold and snow, alternate freezing and thawing, when the nests are broken up, and the protection afforded by the covering provided for them when the eggs were deposited is destroyed.

By giving due attention to all these details in the planting and culture of our great staple, corn, the yield would be greatly increased, even in the most unfavorable seasons, with practically no additional cost. And with the high prices now prevailing for land and labor, surely the time has come for a more general use of brains, combined with muscle, to secure the best results in the corn field. It is the farmer who thinks, as well as labors who is winning sucess, and there is no vocation that offers greater opportunities for research and study than does that of the farmer.

It is not creditable to the farmers of Iowa that the average corn crop of this state is only a little more han thirty bushels per acre, when with our soil and climatic conditions the average should be fifty bushels per acre. Poor seed corn is undoubtedly the chief reason for the poor average, and the planting of corn on worn out, exhausted soil is entitled to second place. The remedy for the greatest loss is within the reach of all, and if the suggestions in this paper are followed to the letter, by every farmer in the state, there will never again be heard a single complaint in regard to poor seed corn.

To restore the fertility of exhausted corn fields, with manure is out of the question, for the acreage is large and the supply of manure limited, but every worn out field now producing from ten to twenty-five bushels of corn per acre can be made to double this yield by seeding with clover and timothy and pasturing for a number of years. To seed with grass and remove a crop of hay proves of little benefit to the soil, but when pastured and especially when a good stand of clover is secured, three years in pasture, with enough grass for two animals, and only one to eat it, will restore fertility as no other means could do, that is within our reach.

In red clover an all wise Creator has provided for us a plant that does not depend, as other grasses or grains, on the surface soil for support, but sends its roots deep into the clay subsoil, and brings to the surface plant food, thus placing it within reach of the shallow rooted grain crops. No other agent known to man can perform this work equal to red clover, and no subsoil plow, with all the power that could be applied, could penetrate the clay subsoil to a depth of 15 or more feet, and bring to the surface of the ground the plant food, stored away for ages, and make it available for the production of other crops that have not been provided with subsoil roots, and must depend for food upon the ground near the surface.

Two crops of corn in succession is all that should be taken from the best soils, the third year a crop of small grain, to be seeded with clover and timothy, and the removel of not to exceed one crop of hay and at least two years in pasture to be again followed by corn, would almost double the present yield of this cereal and at the same time maintain the fertility of the soil indefinitely .

In conclusion I will quote an old adage that I often heard in my boyhood days in Scotland, and it is just as true here as it was on the other side of the Atlantic Ocean: "To secure success in farming, clean your land before it is foul, feed it before it is hungry, and rest it before it is weary." If this is done, and good seed provided, with all farm work done in a scientific manner, the products of our fields will be nearly doubled in value, and to that end we should all strive, with the full assurance that success will crown all well-directed efforts.

The meeting here listened to the reading, by the Secretary, of the following paper by Mr. J. S. Trigg, of Des Moines, who was unable to be present.

PREPARING SEED BED FOR CORN.

J. S. TRIGG, DES MOINES, IA.

During the past year the attention of the corn growers of the state has been particularly directed to the importance of good seed as a factor in the production of a larger yield per acre. It is impossible to estimate the value of the good work done by the state college, the seed corn trains and the many competitive corn shows all over the state. Where four years ago the men were few and far between who could give an intelligent and instructive talk on corn, or could score the samples at an exhibit and who realized the possibilities connected with the development of the corn plant, there are today hundreds of corn growing experts and enthusiasts. It is safe to say that the corn crop of 1905 has been largely increased by the campaign of education made in behalf of better seed corn. While giving the matter of good seed a first place in the effort to increase the yield of this crop, it is still not the whole thing by any means. Even with good seed and a good stand we find a great variation in the yield of corn per acre; we find even when good seed is used many fields giving so poor a return as 25 bushels and other fields yielding from 70 to 80 bushels per acre. The seed has nothing to do with these very greatly varying yields and other reasons must be sought. We do not have to go far to find them and easily realize that to secure a good crop good seed must be planted in a good soil. The purpose of this paper is to briefly invite attention to the relation of the seed bed to the corn crop.

Taking a series of years corn is the most profitable cereal crop produced on Iowa farms, and because of the crop being so readily convertible into all forms of meat, dairy and poultry products, the temptation has been and is now to grow too much, or rather too many acres of corn to the impairment of the soil and the deterioration of the crop. On many farms corn follows corn year after year until the abused and exhausted soil refuses longer to return a profitable crop. Here in Iowa we have come to the period in the state's agricultural development when the question of a sensible and systematic rotation of crops, with the use of legumes and manure can no longer be ignored. The field of virgin soil still returns 70 to 80 bushels per acre. The field of a soil originally just as good and given just the same cultivation returns about

33 bushels or the average yield for the state at large, and this where the stand of corn is rated as good. This difference of 100 per cent in the yield of our staple crops, assuming the seed used to be good, is something well worth considering, worth taking up on special train, in farm institutes, at the short course at Ames and by all our agricultural papers. What we need to do is not to raise more bushels of corn but to raise it on fewer acres—raise 60 bushels where we now raise 30 . There is certainly more pleasure and profit in raising 1200 bushels of corn on 20 acres rather than on 40 acres. Corn following corn prevents a proper preparation of the seed bed for the crop as it prohibits early fall plowing which is of itself an indispensable factor in the production of a good and early maturing crop; further, it is a gross violation of a natural law to persist in growing the same crop year after year on the same land and the penalty for the violation of this law is plainly to be seen all over the state in the ravages of the corn root worm and the many barren and worthless stalks to be found in our corn fields.

A good seed bed for corn implies a sensible rotation of crops. A rotation easy of adoption and well suited to the average Iowa farm is this: Say the field is in corn this year; sow with small grain crop next spring and seed down liberally with clover; the next year take a crop of clover hay and then plow under the second crop not later than the middle of September, then the following year plant to corn. This treatment will furnish a model seed bed for the corn crop; the clover will have subsoiled the land with its roots, will have mellowed and put the soil in almost perfect mechanical condition, will have furnished a much needed supply of humus and stored up for the corn crop in the soil a lot of available nitrogen, the most valuable of all of our fertilizers. Given good seed, good cultivation and a good season one may reasonably expect 50 bushels an acre on a field so treated. Following this corn crop repeat the order of rotation and the second crop of corn will give 60 bushels per acre and probably more. The temptation to grow two or three crops of corn instead of one will be very strong but stick to the text and don't do it and grow but one. This rotation followed up will double the productive capacity of nearly one-half of all of the corn fields of the state inside of six years. Coupled with this method should be the careful saving and using of all of the manure on the farm, which may be applied with the spreader at the rate of five or six loads per acre on the clover during the winter, or after the hay is cut, or it may be put on the corn field after plowing the clover under and before preparing the seed bed. The preparation of this clover sod for the corn is not difficult, as the action of the frost and the clover combined have produced that mellowness of tilth which insures the largest available amount of plant food for the crop. Such a seed bed will in the course of six years, or two terms of such a rotation, become measurably free from weeds if proper cultivation is given the corn crop. A double discing early in the spring followed by the harrow and another thorough harrowing just before planting will put this seed bed in the best possible condition, permit of a uniform depth of planting and the most effective work in subsequent cultivation.

The seed corn gospel having been so efficiently preached we are firmly of the belief that the next step should be with regard to the better care of our soil and the necessity of crop rotation as above indicated be given special attention. As with all other sections of the country, persistent cropping has already impaired the fertility of millions of acres of Iowa land and there is no more pressing or patriotic duty imposed upon the farmers of the state than to at once arrest the degrading agricultural policy so long pursued and restore to Iowa's broad acres the pristine fertility which was the state's ancient birthright, when it may be so easily and readily done. Let the motto be "450,000,000 bushels of corn from Iowa's 9,000,000 acres of corn land." An average crop of 50 bushels per acre instead of 33.

THE PRESIDENT: The next subject we shall take up will be "Good Roads Without Money," by Hon. D. Ward King, Maitland, Mo., who will now address you.

GOOD ROADS WITHOUT MONEY.

D. WARD KING, MAITLAND, MO.

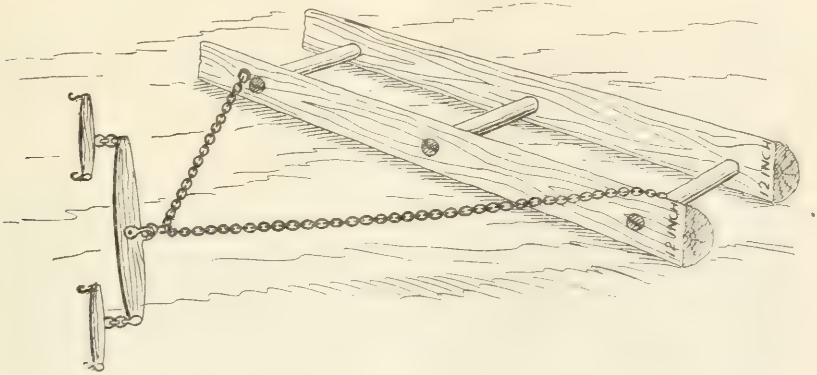
Ladies and Gentlemen: I now desire to talk with you a little about "Good Roads Without Money." It is fitting that I should be at this place at this time, because it was at such a meeting as this, four years and two days ago, that the topic had its first public hearing, at Chillicothe, Missouri, at a meeting similar to this, held by the Missouri State Board of Agriculture, and I wish I could always remember, before every audience which I address, to give credit to the State Board of Agriculture for pushing this method and the push and vim that is in the Missouri State Board of Agriculture; this movement has its inception in that Board. And before I forget it, I also want to say, that while what reputation I may have, has been made almost entirely as an advocate of the dirt road, I am a very strong advocate, in the proper place, at the proper time and under proper conditions, of macadamized roads.

I am afraid we farmers are swinging to the extreme in our position as to macadamized roads. It is true, we have not been well treated; it is true that the average advocate of the stone road does not know much about the farmer's standpoint; but it is also true, that the average community, where land is worth $100 an acre, ought to have some kind of hard material on its main travelled roads. That is all I care to say on that point; I want to put myself on record.

Now, I don't feel safe unless I have this grip beside me, because I never know at what moment a question is going to be sprung which will make it necessary for me to open it. Iowa is not alone in her seeking after emancipation from the mire of impassable mud roads, and it is well for us to remember that we are mistaken, we western farmers, we are mistaken in the idea that we are the only people who have to travel through the mud. I confess, that until this mistake was brought home to me, I had the same feeling that most of you have in that regard. I thought the mud was deeper and there was more of it, and the roads were longer in Missouri than anywhere else. I knew you in Iowa had bad roads, and I thought I knew Nebraska had some mud roads; I thought a large part of that state was so dry, they couldn't make mud. Kansas was in much the same condition.

I was brought up in Ohio, on gravel and macadamized roads. I got the impression they didn't have any other kind of roads. So I had the idea that we western fellows were the people who had to contend with the mud. Imagine my surprise and astonishment, when I received a letter from within 15 miles of Boston, from an editor, asking what they could do, and asking my experience in Columbus, Ohio. I confess, I went to Ohio with fear and trembling. I couldn't see how it came they wanted a man from Missouri to tell them about mud roads, when they didn't have any mud. So I went home, to the old home, and after visiting with my relatives a while who still live there, I went to the court house and went to the Commissioners' office. In Missouri we call them judges—we dignify them there—in Ohio they are called Commissioners. I went to the Commissioners' office and fortunately I found them there, three of them. We talked a little while, and when I first broached the subject, there were no mud roads in the county; all Ohio roads had at least a thin covering of gravel. We finally after some talking discovered there were some mud roads; this was in Springfield, Clark county; one of the wealthiest coun-

The Split Log Drag.



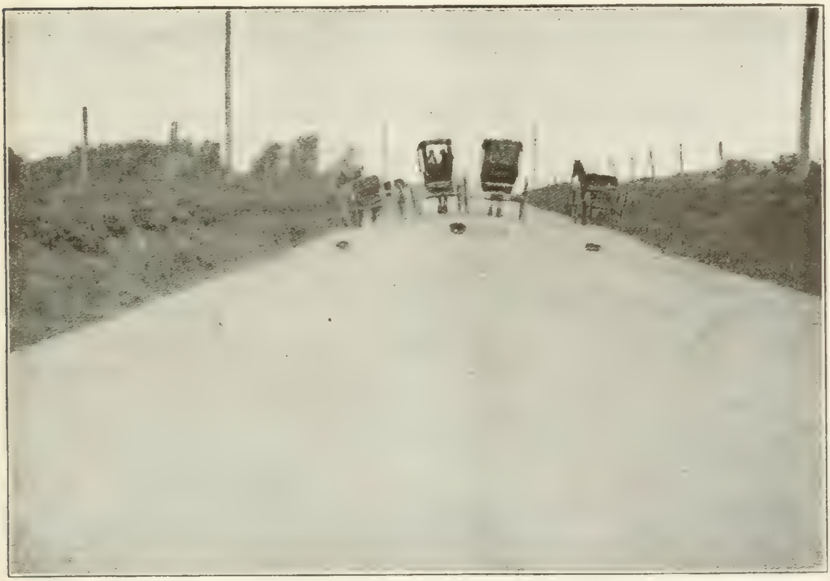
The cut shows in itself how the drag is constructed. The logs are seven to nine feet long and ten to twelve inches in diameter. They are set on edge, flat side to the front, thirty inches apart and fastened together with three strong pins wedged in. Note particularly the way the hitch is made—the chain running through the center of the log at the right end and over the log (looping around the pin) at the left end, this is important. The point of attachment for the doubletrees depends upon the condition of the road and work to be done. The further to the right the hitch is made, the greater the angle at which the drag will be drawn. Place a movable cleated platform on the cross pins to stand on when using the drag. You will find by experience that by shifting your weight on the drag you can change the angle and the amount of dirt it will move.—*By Courtsey of Wallace's Farmer.*

ties in that state of Ohio; one of the up-to-date counties; one of those counties in which they haven't also wealth, intelligence and knowledge, but also plenty of gravel. Imagine my surprise, when I left that Commissioners' office, they were admitting that 25 per cent of the roads were still of the native soil. I went to Columbus. In the course of my remarks there I told these people, that I believed I was safe in saying that 50 per cent of the roads of Ohio were still of the native soil, and all over the house men said, "more than that; more than that." On the 5th or 6th day of October I was in Springfield, Ohio again; I attended a hard roads meeting there. In that meeting was Mr. Martin Dodge, who has been at the head of the office of public roads. I made the statement again there, that I believed 50 per cent of the Ohio roads were in the mud, and he said, "80 per cent." I have reason to believe Pennsylvania is in the same box. I have reason to believe New York is not in any better shape. Now, in Ohio, Pennsylvania and New York, and all these other little scattering New England States, if it is true that those eastern states are still from 50 to 80 per cent in the mud, we are not so much to be pitied after all. But while we are not so much to be pitied, it does add to every thoughtful man the importance of this mud road problem that we think we solved in Iowa and Missouri.

It is no trouble at all to make a mud hole in a wash pan. (Here Mr. King presented a common porcelain wash pan.) Anybody can make a mud hole in a wash pan. This talk seems a little foolish, but I like to speak to the eye as well as to the ear. I want to impress on your minds it is no trouble to make a mud hole in a wash basin; a little earth and water and judicious stirring will make a mud hole. Every one of the roads in Iowa, Nebraska and Ohio where they do not use a split log, every one of those roads contain a greater or less number of basins. Some are the size of a wash basin; some the size of a wash tub; and some are larger than the biggest stock tank you ever saw. They are all made on this order. The reason why they stay there, the reason they are mud holes, is because they are built on the plan of a wash basin. Every one of these mud holes is a wash basin in the fact that it is a receptacle full of water; and every one of them is a mud hole because of the fact that the outside of the mud hole is water tight. That doesn't occur to all of you, but it is a fact, that every one of these mud holes is water tight. Isn't it a fact that you have seen mudholes on the top of hills? Haven't you seen mud holes within 6 or 8 or 15 feet of a bridge, a six or eight foot drop within fifteen feet. Haven't you got in your neighborhood mud holes just on the other side of the bridge, where there is a level place and a mud hole right there, and don't you drive to one side and then on the other side? It is water tight. The only way the water can get out of that basin is for it to evaporate; it takes it a long time.

How many of you would try to make a mud hole on the top of that wash basin? (the basin is turned up-side down). It is still of the same material, the same wash basin. Wouldn't it be more difficult to make a mud hole on top of that? The split log drag turns the wash basin up-side down. Isn't it funny that the water runs from that wash basin whenever you turn it up-side down? It is simple; so simple, that if you hadn't four years of experience, if you hadn't been reading about this, you wouldn't believe me.

Now, there is one good thing we don't always see at the first glance about this wash basin business. If the split log drag is used continually, if it is used every time it ought to be used, the material of which the up-turned basin is made, will turn into a sort of shell that will get harder and thicker continually. There are very few in this state that have been dragged over two years. The roads that have been dragged over two years are better than those that have only been dragged a year. They are not prettier. If you would go to them, after the two year road has been dragged and the one year road has been dragged, the chances are you couldn't tell which is which; but if you go to them during a wet spell, you can tell it instantly. The same thing is true when you compare the two and three year roads. It is not until the road has been dragged the



Number "2 B." This is a photo of a clay hill south of D. Ward King's house that has been dragged since 1896. The hats were placed in the road to bring out the curvature of the surface. This road is 25 ft. wide between the ditches and 40 ft. between the fences. Beginning at the top of this hill and going south a half mile stretch of road has not cost the county a penny since the drag has been used.

fourth year that you can tell the distinction. The point I want to make, there is an increasing benefit; the longer you keep this thing up the better the road will be. Now, it don't get any nicer to drive over, but it will stand more hard travel.

There has been more or less argument concerning the time that a road cared for in this manner will remain in good order. But here is the one thing that we should bear in mind; we should bear in mind that it is better under all circumstances than it would have been if it hadn't been dragged. Men come to me with special cases and they say to me, would the split log drag fix that road, so that I could haul loads as much again over it under all circumstances? I say, that I don't know; I will say, if you use the split log drag over any kind of a road, you can haul that kind of a load over it longer than if you don't use it.

Now, it may interest you to know how we happened to get on to this way of taking care of the roads in Missouri. I have told you I was accustomed to Macadam and stone when I moved to Missouri. Well, the first year or two I was very much bothered, because most of the country laid out. Do you know what that means? You older men know what it is for the country to be unfenced. At that time we used to go across the ridges. We did occasionally have a bad place. The only implements we used at that time were an ax and a spade We took the ax and cut willows and threw into those places, and then we spaded on enough earth to keep the horses from hurting themselves. After a while the railroads came through; then a few miles of land was fenced, and the travel concentrated between the fences; then came our trouble. I have seen it so bad, that I would leave the horses and go on foot. There was a clay hill over a half mile up which many times I found it necessary to rest my team hitched to a buggy. I think I have seen that hill in such a condition that it would pretty nearly stall a team going down hill. All this grated on my nerves; it made me impatient. I sought some way out. In the inquiries I made one result was the sending to use of a big grader; in Nebraska they call them blade machines. That made a very great improvement with us. There were still times when it was better to go down horseback than in a buggy. For years I carried a spade or hoe in the buggy. I found I could prevent a great deal of damage by just opening the side of the road. You all know, and I remember particularly a place where my land corners with my neighbors, two hedges came together. There was a place there where the snow lodged, and unless somebody went there and turned the water to one side, it would remain there. Somebody used a word here a while ago that I thought applied to me. He said he "stumbled on to something." I stumbled into the matter of dragging roads. I went out one morning and hitched my team to a contrivance that had been made by one of the hands. The contrivance was made out of a pump stock and a piece of oak; three pieces of six inch fence boards had been nailed on to it. I hitched on to that thing, so that when the team was driven with one horse each side of the wheel track, this pump stock business followed at an angle of 45 degrees. Driving along in this manner, the tops were broken off and a great many low places were filled up with

Number "3 C," is at a point where an undragged road intersects the dragged road and is perhaps 200 yards distant. The dragged road was in fine condition. The soil, the lay of the land, and the drainage are exactly the same, yet right in front of the team there was a long dangerous mud hole as shown in "4 C."

The photograph number "4 C." shows a long mud hole just in front of the team it the "3 C." photograph. It was so bad that we were afraid to have a photograph of the team taken in it, anticipating that the horses would get mired. In the distance can be seen a railroad bridge. The railroad and wagon road run at right angles to this road. The wagon road which crosses the "4 C" road had been dragged for two years and was hard, smooth, dry and even dusty at the time "4 C." was taken. The soil the lay of the land and the drainage are exactly the same in both these roads. Ten men spent a half a day in this mud hole draining and ditching in order that it might have a chance to get into passable shape. The same amount of labor spent on a quarter of a mile of this road, would have kept it in "apple pie order" for a number of years.

ground, and the larger chunks and clods were carried over and deposited in the middle of the road. When I got to my neighbor's front gate I turned and came back over the other wheel track. I kept that up that summer, and the next winter I didn't do anything. It took me two years to learn I could accomplish as much in the winter as summer. The next spring I started again. I didn't go half way down the first hill until the thing spread. I remember, I felt very much provoked. However, the results I had secured the year before gave me so much satisfaction that I immediately set about for another apparatus. It just happened we had a box-elder cut down, a shade tree which laid out at the wood pile. It was a crooked tree, and when it split, it split with a wind in it. Nevertheless I succeeded in making use of it, the picture of which you have seen so many times, and which has done more than anything else to make the road famous. I used it for five years and when it did break it broke right off like a cob. I mention these facts in order that no man may think he doesn't have anything to do it with.

A gentleman down at Mt. Ayr, Iowa came to town; he had made his piece of road famous; he made it out of a willow log. He said to me it just cost him twelve cents. Presently the neighbors began to take notice; it was however not until the end of the fourth year that any of the neighbors began to drag the road. At the end of five years, as I recall it, just about six weeks after this time, the farmers institute was held in our town, and at the suggestion of Mr. Geo. B. Ellis, a corps of interested lecturers came out to look at this road; that resulted in my address at Chillicothe, and that was the beginning of the split log drag work.

I am so well satisfied that I am talking to a great many men who have tried the log drag, that I hesitate to say many things. There are three things absolutely necessary in order to have a perfect earth road. Now, it doesn't make any difference which one of these things I mention first, because, they are, as near as I can tell, all of equal importance. You cannot take any one of the three away without destroying the road in the end. These things are, smoothness, hardness and convexity. It must be hard, smooth and oval. If it is not oval, it will soon go to pieces. It may be oval, smooth and not hard, and you know how they are when there is about a foot or two feet of soft earth in the middle of them; when it is comparatively smooth and not hard. If you have them smooth and not hard, as I suggested a while ago, they won't stay in order. Under all circumstances they should be given the three qualities. The reason why we haven't had these qualities in our roads before are two. One is, we didn't know that these qualities would bring results; the other reason is, we didn't know that these qualities could be given, except by the use of expensive means. By the split log drag we have learned a very cheap way of improving the roads; a cheap implement; an implement which only costs one, made, from 75 cents up. A gentleman in central Missouri made a dozen or more of them and they cost 75 cents a piece. It isn't so essential that the drags shall be made out of any particular stuff, as it is that they should be made in a particular way.

Now, while I am speaking about drag, I hope you and your neighbors will not fall into the mistake I made in some places in Indiana and Michigan and over in Nebraska. I found men who understood drag to mean harrow. I spoke at Wahoo, just south and west of Omaha last winter. One county officer didn't get to the meeting, but he heard some things I said. We took the same train, and we had about ten minutes of the hardest wrangle you ever heard in your life. At the end of that time I found that all the trouble arose over the fact that he understood by drag I meant harrow; so of course, we couldn't get together. Mr. Roosevelt had an experience of that kind on his recent hunting trip. You all remember he took an outing. Presidents, like everybody else, like to be alone at times. So one morning he got up before the rest of the party did, and started across the prairie. In fact, he went so far, that when a storm came and he tried to get back to camp, he was over taken and got a good soaking. As he jogged along near the camp, he saw before him a one horse buggy with two ladies in it, and as he came closer he saw they were holding an umbrella over the horse, as he got up near them he rode beside the buggy and said: " Ladies, how does it happen that you sit in this drenching downpour and hold that umbrella over the horse." One of the ladies replied: "This is a livery horse. and the livery man said. we would have trouble with this horse if we let the rein get under his tail."

Now, it is quite important, when people use words, that the same definition be placed upon them, and remember that the man who listens to you may be thinking of a harrow. I believe to-day, the greatest thing that needs to be impressed upon the people of Iowa can be summed up in two words—I am speaking now of the most important thing that every man who has to do with the roads in Iowa, the most important thing for him to remember is *don't wait.*

Now, I talked to a man yesterday, an editor— my newspaper friends are the best friends I have. I don't think anybody has done more for me and the roads in Iowa than the newspaper men have. Yet a newspaper man within the last three days; a man, who so far as I know, never drove a team or walked behind a drag in his life, insisted to me that we must tell the farmers to go out and use the big graders first. If you want to use a grader, use it. Don't wait for the grader; use the drag first. Now, some of you have an idea you will have to plant a whole lot of drain tile. All right, plant them; don't wait, use the drag first. Some of you live in a hilly country; you have in your mind some spouty places half way down a clay hill. You will say, Mr. King, we can't use that road until we get that spouty place drained out. All right; drain it out, but don't wait. There is a spouty place that faces my house; the water is running on both sides of the road. It has been running there nearly all fall and summer. It has been running from within five or six feet from the top of the hill. It has never broken through; it has been smooth as this floor, almost all the time. There isn't any tile there.

They talk to me about capillary attraction—if I wasn't so close to his home I would mention his name—I beg the pardon of the newspaper men; he also is a newspaper man. They say, you can't tell me you can make a road like that unless you take the water away from the ditches. What are you going to do with a man like that? Men ought to be willing to believe I know something of what I am saying. Let me argue with you a little about that.

You men who live on level land, isn't it a fact that there are times on your own land, when you drive down through a road, and the bottom of the wheel is lower than the water is outside. Isn't it a fact you drive over these places a good many times when you can see the water shaking? You are driving at the bottom of a wash basin. Where does capillary attraction come in? By your own experience, is it not a fact that capillary attraction don't come to the top of a wash pan?

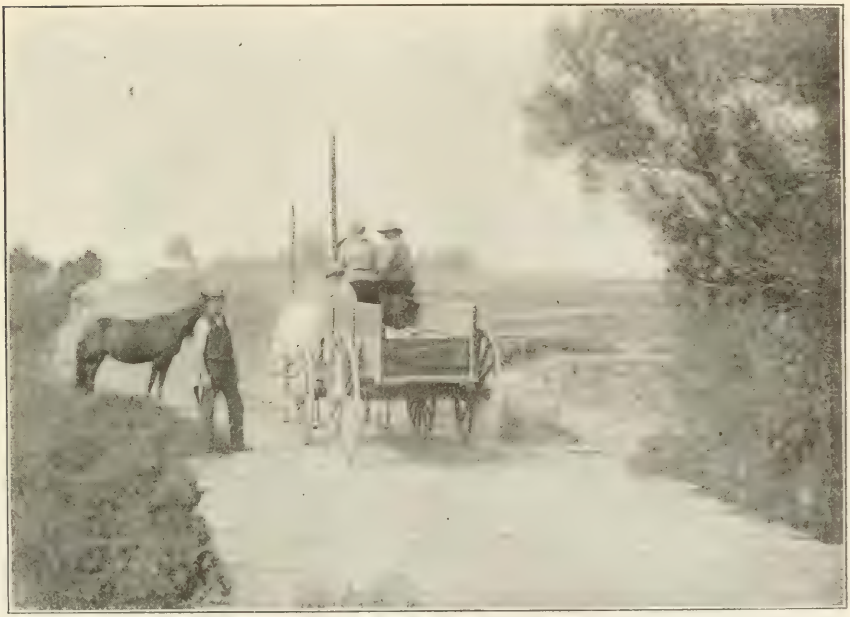
Let me read you some other men's experience. I have three different statements here:

(Here Mr. King read several clippings from newspapers, as well as extracts from letters to illustrate the different positions taken by these writers, and in several instances a second expression from the same writers confessing the correctness of Mr. King's position.)

Now, there are two points I have been trying to cover; one is, you needn't be afraid of capillary attraction; the other is, you needn't wait for the grader, even if the road is in bad shape. If your road is grown over with sod, it hasn't been traveled much. If your road has cut ridges through the sod, what is the use of taking a big grader in there? Is there anything meaner on the top of God's green earth than trying to manage sod with a big grader? Doesn't it always bunch up on you? Go in there some time when the sod is real wet and cut it all to pieces with the disc. All you have got to do is to cut a couple of feet on each side of the track. It isn't so expensive as the big grader, and more than all, you haven't waited for a year to get the big grader to fix it. I expect some men in this house are waiting for the big grader to come and fix their road, so that they can use a drag on it. Don't wait.

One other point; the state of Iowa is convinced that the split log drag is a good thing; we have been convinced by the individual effort of public spirited men all over the state. There has been no money behind this thing to push it. There has been no chance for profit for men who expected to push it; there has been nothing but public spirited, enterprising men, trying since last April to prove to the state of Iowa that the split log drag is the thing. Now it is time to make another step. I want to tell you what the next step is. I believe the next step is for the township and county authorities to employ men by contract to drag the road. Listen to me first. I believe that no one drag should be allowed to operate on more than one mile of road. Whenever you drag a road for three or four years, you find out that this has come to pass, that if you have got more than a mile, you leave home when the road is in nice condition to drag. You get back to the other end when it is too hard. Isn't it a fact that the worst thing that can happen to the road, when it is just in the best condition, that the day you ought to drag comes on Sunday. I heard two funny things about Iowa men. One got out and dragged the road on Sunday, and the other by moonlight. He was out dragging by moonlight and his brother came along and he said: "You blamed fellow, what are you doing?" "Why dragging the road; it is none of your business; I have got to haul corn over this road this winter."

A drag will keep three miles of road in better condition than if it wasn't dragged at all. Let this contract to a man, if possible, who lives at the other end of the road to the town, and let it, if you can, to a progressive man, who takes pride in his work; a man who will try to do the work as it should be done. You have got them all around here who will do $1.10 worth of work for a dollar. You have got to have a fighting organization. You know, there are so many men, when they see a good thing, they want to organize—I don't mean putting water into stock—they think they can get a President and Secretary and put that on paper, and everything will be fixed. I know better. I know it takes men and teams on the road. In organization there is strength; that is an old



Number "2 D." is a picture of the bridge at the foot of the clay hill shown in '2"B." photograph. The hind wheels of the wagon are on the bridge and the fron wheels are on the earth. Compare the bridge with the bridge shown in "5 D." where also the hind wheels of the wagon are on the bridge and the front wheels on the earth. These bridges are about one-fourth mile apart, only the one hill between them.

saying. Some of you know it makes a difference which way you put them together. You can put two 2's together and it will make four. Again you can put two 2's together, and it will make 22. Now, if we can get the organization of the township, or of the county to bear on this matter and they are doing it in Missouri, and I know several counties in this state where they are doing it, we will get at least all of the main traveled roads dragged.

There is great virtue in organized effort. A number of years ago, in California, there was a street car strike, and the strikers had thrown a car off the track and it was the worse for the wear. The policemen hurried down to the crowd, where the men were trying to tear up the track with crow bars and hand spikes. The policemen raised their clubs, and said, "You must stop this." One of the boys raised up his hand spike and said, "You can't make us stop," and the strikers went on with the work of destruction. Presently one of the boys put his hands to his ears, and he said, Sh—! when he could hear the tramp of the measured

"5 D " is a picture of a bridge intended to be compared with number "2 D". Had the road at "5 D." been dragged regularly the two bridges would have been in the same condition.

footsteps, "the regulars are coming!" Around the corner came a column of green coated men, with rifle in hand, behind each rifle a determined soldier. On they came, the officer marching them right in front and up to the strikers. He raised his sword. He said: "Halt! Make Way! Aim! Lay down those hand spikes!" They laid them down. A small body of organized men against a mob of hundreds.

We can get the same effect by organizing the forces here in this state. We desire to see the roads made better, and everything organized to bring strength to bear on the bad roads of the state.

A MEMBER: I would just like to have Mr. King tell us about this split log drag, when to use it. We are having some dispute in our county.

MR. KING: There is just one time the split log drag may be properly used. If you drag the road when it is muddy, the first time you drag it, every other time you drag it after that, it must be at a time when the soil has become, not dry, but it must not be sticky, it must be moist.

A MEMBER: Isn't there a difference in soil?

MR. KING: Yes, sir; there is a difference in soil; every man has got to study his own soil and own piece of road. Every man will have to ride his drag over different sections of the same road. I have been riding a drag for ten years. I can take an old drag and a good team on the road and pretty near make it talk. You will find, if you will use your brains you will get a good deal better results.

A MEMBER: Where the road don't bake, couldn't you drag it better?

MR. KING: There is no such a thing as the soil not baking.

THE MEMBER: The more sand the soil has in it the less it will bake. We have soil where you can go right out after the rain and it won't bake.

MR. KING: I would like to see that kind of soil; I am from Missouri.

A MEMBER: How about the winter?

MR. KING: You can do more good in the winter time than in the summer for the same amount of labor. If it thaws just an inch and a half deep, along in the afternoon, as it frequently does, there will be just about an hour you can drag over the road, and you will see what it does.

A MEMBER: How heavy a drag do you use and how long?

MR. KING: The drag should be as light as possible. The best drag I have made, I made out of a cedar telephone pole. If you have a 1600 pound team, you can make a drag 9 feet long.

All you people who want to know more about making good drags, write to Thomas H. McDonald, of the Iowa Commission, at Ames for a Bulletin.

Gentlemen, I thank you.

THE PRESIDENT: The program will be continued this afternoon promptly at 2 o'clock. We will now stand adjourned until 2 o'clock.

AFTERNOON SESSION.

THE PRESIDENT: The first subject on our program will be "Sewage Disposal for the Iowa Farm Home," by Prof. A. Marston, Ames.

SEWAGE DISPOSAL FOR THE IOWA FARM HOME.

A. MARSTON, AMES, IA.

One of the most important remains of the work of the ancient Romans which still defies the hand of time is the Cloaca Maxima, the great sewer of the ancient Mistress of the World. Among the ruins of Jerusalem the curious modern antiquarian has discovered the remains of ancient sewers. But while it is true that the ancients did develop sewerage to an extent which has not been understood until recently, yet it is also true that after the fall of Rome the principles of sewerage were lost sight of for hundreds of years. In fact the development of sewerage according to modern principles is mainly the work of the last one hundred years. Prior to that time work in this line was not done according to scientific principles, but in general followed no systematic plan, drains hardly worth the name of sewers being constructed here and there as necessity compelled. The development of sewage disposal has been of still more recent date. Until within the last twenty-five years the one thing done with sewage was to carry it to the nearest possible outlet, and there empty it without regard to the health or convenience of other communities.

Within the last twenty-five years, however, the necessity for disposing of sewage by more scientific means has been forced upon an unwilling public, and a great amount of attention has been given to the subject. Some of the most important developments have occurred within the last ten years and the work of research and improvement is still going on.

In Iowa the first sewage disposal plant was built in 1898, only seven years ago, but since that time quite a number of plants have been put in operation and during the present year alone five sewage purification plants have been under construction. What is being acomplished in Iowa along this line may be judged from an inspection of the two bottles which I have here, one of which contains sewage effluent from the first sewage disposal plant built in Iowa, viz., at the Iowa State College, Ames, Iowa, while the other contains pure well water from the water supply of the same college. In case any of this audience are further interested in what is being done by Iowa towns in the way of sewage disposal, I have here for distribution copies of Bulletin No. 7 of the Engineering Experiment Station of the Iowa College which describes all the plants built in the state prior to 1904. Annually the Engineering Experiment Station inspects all the plants in the state, making chemical and bacterial tests of the efficiency and obtaining data of the working of the plants.

Within the last two or three years an increasing number of inquiries have been coming to the Engineering Experiment Station as to what can be done with sewage on the farm, and to enable us to obtain, if possible, the proper answer for these queries, we have been experimenting with sewage disposal plants for private houses, such as can be built for a small sum of money, within the reach of the ordinary well-to-do farmer. It is slow work carrying out such experiments properly, since any particular method of disposing of sewage should be tested for at least one entire season before it can be certain that it is a success, and as a result we have not been willing to publish the results of our work, nor shall we be ready with a bulletin on this subject probably much before another year elapses. However, in response to a special request from your Secretary we will describe for you the present status of our work in this line.

First let me say, however, a few words about the need for modern sewerage conveniences on the farm. When one stops to think, it really seems little more than a relic of barbarism that our present up-to-date farmer should be content with the same primitive arrangements as to sewerage which were a necessity in the pioneer days of the state. Just as a matter of progress the ordinary out-house and privy vault should be relegated to the same place as the ox-cart and the brush harrow. When we add to this the untold and even unsuspected suffering and injury to health which may result from the exposure of delicate women and children to inclement weather and winter temperatures, the present ordinary sanitary arrangements on the farm must surely be considered barbarous. Besides this, the ordinary privy vault is polluting and befouling Mother Earth herself in the vicinity of our homes. All sanitary reasons are in favor of substituting something more in line with the demands of health and convenience.

Of course the first step necessary in supplying modern sewerage facilities is to obtain a satisfactory water supply; but here the farmer should have little difficulty. Fortunately it has been necessary that he should provide a water supply for his stock whether the kitchen arrangements are convenient for his wife or not, and hence every farm has a supply of water from a well or other satisfactory source. In a large proportion of cases, also, some form of power pump has been supplied and the winds of the prairies have been compelled to lift the water to the stock tank. The farmer has but to extend the use of his wind mill a little to enable the water to be piped all over his house, supplying the bath-room and relieving his wife of the toil and inconvenience of going to the outdoors well to obtain water for the kitchen. The water may of course be pumped to an elevated tank from which it is distributed by gravity, but it is difficult to protect such a tank from freezing, and its leaking is apt to be disastrous to the house in case it is placed in the attic. It will be better therefore to use a compressed air tank. This tank is made of steel like a steam boiler, and may either be placed in the cellar or buried in the earth entirely outside the house. Into it the wind mill pumps both air and water under pressure, and the pressure of the air in the tank is sufficient to force the water any desired height. The cost of such a water supply is within the reach of well-to-do farmers.

The possibility of obtaining a satisfactory water supply makes it possible for the farmer to have in his house the same sanitary conveniences which have attracted so many people to city residences. He may have his bath-room with wash-bowl and water-closet, his wife may have sink conveniences for her work, and a laundry room may be readily provided in the cellar, cool in summer and warm in winter, and containing covenient arrangements for obtaining both hot and cold water. All of the above may be supplied at a moderate cost.

I would like to say a few words here of caution regarding the plumbing of the farm home. There used to be a mistaken idea prevalent that sanitary fixtures could be placed in any dark out of the way place. The householder seemed to think that if he could only conceal these fixtures the germs of disease would never find them. More correct ideas now prevail. The plumbing fixtures should be placed in well lighted and well ventilated rooms having windows opening into the outside air. The fixtures themselves should be exposed to open view in all parts without any spaces enclosed and concealed by woodwork. The pipes should run where they can be readily gotten at. Immediately under each plumbing fixture should be placed a trap to disconnect the house from all communication with the sewer or the interior of the pipes. These traps usually consist of a simple depression in the pipe which remains full of water all the while. The fixtures should be of porcelain or enameled iron, that is of non-absorbent materials which can be readily kept clean. The kitchen sink should be supported on brackets and not be considered as a roof for an enclosure in which old boots and rags can be stored.

In a house supplied with the modern sanitary conveniences the fixtures required are water closet, bath tub, wash bowl, sink, and laundry tubs. The laundry tubs, of course, can be dispensed with, but it is very desirable that a laundry room should be finished up in the basement, with a cement floor and windows to supply light, and with a properly trapped opening in the floor by means of which the laundry water can be readily gotten rid of.

We come next to the sewer by which the waste liquids from these plumbing fixtures is to be removed from the house. Here let me say that under no circumstances should any kind of pipe or conduit be used inside the house which is not made of either iron or lead. The use of sewer pipe should be discontinued at a point about six feet outside the outside wall of the house. It is impossible, even with the utmost care and the most free use of cement, to make the joints in the sewer absolutely tight. If it is continued under the house there is danger of the escape of sewer gas into the earth and air under the house itself or even of the leakage of sewage out of the sewer. Inside the house all the conduits of the plumbing system should be both air and water tight. The main pipe, which is called the "soil pipe", should be 4 inches in diameter and should extend in a direct course and of full size above the roof to afford ventilation.

The sewer outside the house should not be laid close to any cistern or well, for there is danger that some leaky joint might permit the escape of sewage to pollute the water. In case it becomes absolutely necessary to pass near a well or cistern the sewer should be constructed of cast iron pipe with leaded joints made absolutely air and water tight.

Except in such cases the sewer from the house to the point where the sewage is disposed of should be made of four-inch vitrified sewer pipe. It should be laid very carefully to line and grade and the joints should be very thoroughly cemented with a rich Portland cement mortar. To lay the sewer to grade the only proper way is to tightly stretch a cord parallel to the grade line and have it supported say every twenty-five feet. Then by a suitable measuring stick *every* pipe should be laid exactly to the proposed grade. Unless the fall is very rapid it will pay to have the grade stakes set for the sewer by a surveyor. It will take only an hour or so of his time to have this done unless the sewer is very long. The sewer should be given a fall of two feet to the hundred, if possible, and certainly not less than one foot to the hundred. While four-inch sewer pipe is ample in size yet there is no special objection to using six-inch, if desired.

This leads us to the question of what is to be done with the sewage. The most common means of disposing of the sewage of cities is simply to discharge it into some considerable stream, and in a small proportion of cases it may be possible for the farmer to do the same thing. If he is located near a stream of considerable size he could discharge his sewage into it with greater justice and less danger of doing injury than in the case of a city. Of course, however, a great majority of our farmers are not located sufficiently close to a perennial stream to enable this to be done.

In some cases ravines or dry ditches may be located sufficiently near so that the sewage could be drained into these. Under such circumstances careful consideration should be given to the possible damage from stock drinking the sewage. One of our Iowa cities now has a judgment against it for some $4000, I believe, for injury mainly to stock from discharging its sewage into a small stream which ran through a pasture. In another case known to me a valuable herd of blooded stock contracted disease from drinking sewage from a ditch below the outlet of a city sewer.

In a very large proportion of Iowa farm homes it will be necessary for the farmer to dispose of his sewage by other means than simply discharging it into a stream or ditch. The old means used in such cases was the construction of a cesspool, and instead of making this cesspool watertight it was undertaken to make it as porous as possible so as to avoid the expense and discomfort of having to clean out its contents at intervals. Such "leeching cesspools" are often more objectionable on account of polluting the surrounding wells than is the privy vault, for the quantity of material discharging into them is increased many fold by the water from the plumbing fixtures, and consequently the pollution is carried further into the surrounding soil. I have known of cases in localities having limestone rock underneath where the individual householder congratulated himself because his cesspool had an outlet into some seam in the rock. Perhaps on an adjacent lot, or even on his own lot, was located a well and it is quite possible that this same seam in the rock communicated directly with the well. In one town in this state it is said that the construction of a city well in such a formation caused private wells in the town to go dry. Incredible as it may seem, in the case of an intelligent community, the same private wells were then utilized as cesspools. Wherever a cesspool is used to dispose of the sewage of a house it should be made absolutely watertight by lining it with plastered cement masonry, and as often as necessary the contents of the cesspool should be pumped out and carted away. This, however, is expensive and the cleaning out of such cesspools is a very disagreeable task.

In the recent development of sewage disposal the sewage is purified by means of certain species of bacteria. Within the last few years it has been found that one class of bacteria can be utilized in a tank somewhat like a cesspool, which is called a septic tank. By the way, this word "septic" is sometimes miscalled "antiseptic." In the septic tank we encourage the growth of bacteria instead of discouraging their growth as the word "antiseptic" would mean. In the septic tank the kind of bacteria cultivated are what are known as "anaerobic bacteria", viz., those which do not require air and oxygen to live. These anaerobic organisms seize upon the organic matter in the sewage and partially break it up and change it to mineral form. After a time much of the solid matter in the sewage is liquified. A septic tank is nothing but a watertight tank of proper size and arranged in accordance with certain principles, into which the sewage is discharged. The sewage itself contains enough of the proper organisms to start them in the tank and within a few weeks they become established of themselves in sufficient numbers to act properly upon the sewage. The proper size of tank for the individual family is a matter upon which we are still experimenting. It should probably contain three hundred to five hundred gallons. The inflow of sewage should be through a vitrified pipe placed just above the level of the water in the tank and turned down so that the sewer will be trapped off from connection with the septic tank. Similarly, at the outlet end some means should be provided, such as a baffle board extending from above the surface a distance of fifteen to eighteen inches into the sewage, to hold back all scum which forms on the surface of the sewage. The tank should be made water tight and the opening provided for cleaning it should be provided with a tight cover.

The overflow from the septic tank usually contains a considerable amount of fine inky black particles which represent part of the organic matter in changed condition. In the form of septic tanks with which we are now experimenting we are trying to filter out these black particles so as to leave the effluent more clear, and while we have not yet demonstrated finally that this attempt will be a success, yet as the necessary arrangement can be provided with very little additional expense I would advise using it. I present herewith a drawing with dimensions, showing the details of the septic tank which, in the present state of our experiments, we believe would be the best to construct.

In the septic tank from thirty to fifty per cent of the polluting matter in the sewage can be removed. A small part of this matter remains in the tank and about once a year such a tank would be pumped out or bailed out. It should not be attempted to thoroughly clean the tank as this would destroy the organisms of purification. In a properly constructed tank there should be little or no offensive odor and even the cleaning out will not be found to cause an excessive amount of odor.

The effluent from the septic tank, even if clear, should not be considered as thoroughly pure water but in many cases on the farm it can be led away directly into a tile drain without any further treatment. Frequently it will be found that practically nothing escapes from the mouth of the tile serving as overflow for such a tank. The liquid being so clear that it soaks into the ground through the joints of the tile. Very frequently such a tank may be all that is needed to dispose of the sewage of the farm.

However, in the case of a city plant it is usually necessary to filter the effluent from the septic tank in order to secure the degree of purification necessary. The filter for the city plants usually consist of large beds of sand to which the sewage is applied in intermittent doses. The work of purification is done by what we call "aerobic" bacteria, viz., those which require air and oxygen for their life and work. The sewage contains enough of these organisms to start the beds and after a few weeks they become established in countless billions in the pores of the sand. As the sewage trickles by them they act upon the organic matter and thoroughly purify it. As each dose of sewage disappears it draws down air into the pores of the sand so as to keep the organisms alive. By combined treatment in the septic tank and filters ninety to ninety-nine per cent of the organic matter and nearly all of the bacteria in the sewage can be removed. We are still experimenting with kinds of filters suitable for use in connection with the sewage disposal plant for the farm but we have not yet found anything simple enough to recommend for general use and our work is still proceeding along this line. We believe that we are on the right track but are not ready as yet to say anything definite for publication.

In conclusion let me say just a word or two about the farm home of the future. I believe that in the great recent scientific developments in connection with agriculture we have paid too little attention to the farm home itself, which, after all, must be the center and principal object of all our agricultural work. Why should not some attention be given to the architecture of the farm home, and why should it not be surrounded with a lawn laid out in accordance with the principles of landscape gardening? To attend to these points may not require much if any additional expenditure of money and what a difference could be made in the attractiveness of our homes. The farm home to which we have a right in the near future will be attractive in every way and will be supplied with all the conveniences of modern life, including water supply, sewerage, and furnace heat. It is even now in telephonic communication with the market and with neighbors and even now the mail is delivered daily at its door. Within a few years let us hope it will be made such an attractive place that the problem of how to keep our boys on the farm will be solved.

THE PRESIDENT: The next subject is entitled, "The Five Day Market," by Frank O. Mills, of the National Live Stock Commission Company, Chicago. As Mr. Mills is unable to be here, we will ask Mr. R. S. Johnston to read his paper.

THE FIVE DAY MARKET.

FRANK O. MILLS, CHICAGO, ILL.

Mr. President, Ladies and members of the Iowa State Farmers Institute:

President Morrow has assigned to me responsibility for handling a topic that, if not of paramount importance, perhaps, to the live stock shipper and grower, it is at least worth thoughtful consideration.

I am glad the gentleman who prepared this programme recognized the importance of what is known as the "Five Day Market," and I am convinced that at these annual gatherings problems relating to the transportation and marketing of live stock ought to be discussed. Nearly every farmer in the great state of Iowa either raises or ships live stock and, whether he markets it himself or sells at home to a shipper, he is interested in the maintenance of the most favorable market conditions, because, unless they exist, maximum results cannot be realized; and, I address an Iowa audience on this topic all the more readily because Iowa contributing as it does a large proportion of the cattle marketed at Chicago, is in a position more than any other state to, at least partially, remedy the evil I shall attempt to portray.

A preliminary brief review of the mutations of the past four decades, the period of development of the Chicago Live Stock Market, is essential, and may not prove uninteresting. When the present Union Stock Yards at Chicago were thrown open for business on Christmas day, 1865, trade was conducted on a much different basis. The great slaughtering houses at Chicago did not even exist in embryo. New York dominated prices, especially of cattle, at every primary receiving point between the Missouri River and the Atlantic sea-board. Chicago confined slaughtering to local receipts, and the bulk of cattle received at that market, after passing out of first hands, were taken by purchasers to Eastern markets. This created the necessity for a three-day-market, and the system was suited to the period that created it. Purchasers, in order to insure placing cattle on Eastern markets at the time required by custom there, operated at Chicago on the Monday, Wednesday and Thursday sessions each week, leaving for the East after filling their orders. This being their practice, commission men, as the agents of the owners, and acting with the object of conserving their best interests, advised them to load to catch these principal market days. It was as essential then as the five-day-market is now. Competition was keenest on the three days I have named, and cattle then offered received the benefit of it;

custom thus establishing a practice that yields with reluctance to the requirements of a new trade era. During the past 25 or 30 years the volume of marketing in cattle, hogs and sheep has increased enormously; methods of reducing live stock to meat product have changed radically; new channels of trade, in and out, have been created and necessity for new methods of doing business have arisen. From time to time, according as the pressure of these mutations has been exerted sufficiently, the trade has adapted itself with more or less facility to the new, discarding step by step the old; but in one essential feature conservation has held its ground, and the off-day-market, as it is erroneously termed, still fails to find favor with many shippers whose skepticism is unquestionably adverse to their own interests.

"Figures do not lie," although some wit has asserted that "Liars will figure."

Quoting official counts, the largest single day's receipts at the Chicago yards were: Cattle 44445, hogs 74551 and sheep 59362, and, while I must admit that I have experienced more unsatisfactory markets with much smaller receipts, you will readily see that when such an enormous number of animals are thrown into the stock yards during a single session, proper handling is impossible. Railroad facilities fail, terminals are congested and stock yard alleys and pens glutted. Commission men, no matter how efficient their yard forces may be, or how complete their arrangements for giving their patrons good service, fall down, to use the vernacular; whereas, had the excess been shipped to arrive on the so-called off-days it could have been handled more advantageously by railroads, stock yards and commission men, shrinkage avoided, sale and weighing facilitated, and loss avoided. It is the accomplishment of this purpose to which both sides of the market buyers and sellers, are strenuously exerting themselves. Even when united we are powerless without the cooperation of the shipper, and it is with a confidence that I may be able to make a few converts that I present this statement of facts.

Now, we all know that there is no philanthropy in business. I never saw any of that abstract quality lying loose around the cattle market. Buyers are in the saddle to take something off whenever the opportunity presents itself, and they sleep with the same soundness that marks the slumber of the average weasel. When they put something on it is with reluctance, and simply because the man who is selling the cattle is able to carry his point. From long experience I can assure you that this is no easy task. Consequently, whenever gluts occur on the principal market days, as they have a deplorable fashion of doing, the buyer promptly swings his hammer—and not only that. There is an old adage, "Do not buy a thing because it looks cheap, unless you need it." I believe all the buyers in my circle of acquaintance keep this posted in their hats because on such occasions many cattle do not even elicit bids. "Can't use 'em" is the answer we get in response to our appeals to buyers to look at the cattle. You know what that means: an over-supplied market. Who pays for it? The shipper of course. Killers, profiting by long experience, do not buy stuff because it looks cheap when they do not need it, for the simple reason that holding it 24 to 60 hours in the yards, until killing gangs can give it their usual warm reception, is expensive. The incidental loss they prefer to saddle on the shipper. Feed bills cost money, and cattle laying around the yards, off their regular feed, do not thrive as you all know. Under these conditions an additional loss to purchaser of 10 to 25c per cwt. may soon be incurred, and frequently is, while quality of the beef deteriorates during the detention. The present two or three-day-market system, according as you may designate it, has evaporated a vast amount of bovine wealth, every dollar of which has been so much money our of the pockets of growers and shippers.

We are now making joint efforts to remedy this evil. Buyers and sellers are acting in concert. It is a campaign inaugurated two years ago, but not yet completed. We aim to secure equal distriution of supply over five days of the week. During the past two decades the slaughtering industry has been revolutionized, while we have been plugging along in the same old rut on the market side. We have the buyers with us, every purchasing agency on the market having entered into an agreement to do everything possible to facilitate the reform. Of my own knowledge, I know that some buyers have, on days of excessive receipts, reduced their purchases that they might be in better position to care for the next day's run, thereby keeping faith with the shipper who was showing a disposition to co-operate with them and make this much needed reform an actual fact.

Long estalished customs are not easily relegated to the past. Business men are laudably conservative, and we did not begin this campaign imbued with any degree of confidence that a few week's effort would accomplish the desired end. The territory from which Chicago draws its live stock supplies is vast. On the West it extends to the Pacific, on the South to the Gulf, on the North to far away Alberta in Canada and in the East to Michigan and Ohio, and to establish such a radical change, even during the two years we have been engaged in the work, would have been phenomenal, but we are making progress, rapid and convincing progress. It is a recognized fact that whenever the supply of cattle is at all evenly distributed through the week, not only are prices better, but the market has better action and the movement toward the scales is earlier and livelier. This means a saving in shrinkage, and shrinkage is always at the expense of the vendor.

There may be some skepticism as to the honesty of purpose of the buyer in advocating a five-day-market. Are not market gluts to his advantage? is the inquiry propounded. I answer emphatically in the negative. Buyers (I mean the men who buy the cattle in the yards) have everything to gain by the reform. Their records are made on the showing of the dressing sheets. Every animal killed is carefully tested as to percentages of live and dressed weight, tallow, offal and hide, and the buyer whose purchases do not show a profit is soon dropped. Now, with equal distribution, the buyer also salesman has more time to examine the cattle and bid or price them on their merits. When he is required to do the work of five days in two it is not surprising that his judgment, hastily formed of necessity, is faulty, and when he is unable to appraise cattle on their merits the owner frequently suffers grievously. The five-day-market system will work to the advantage of all concerned, shippers, railroads, stock yards, commission men and buyers. It is a reform that ought to have been affected 10 years ago.

Gentlemen! We want Iowa to help us make these Monday and Wednesday gluts, things of the past. With evenly distributed receipts results will be more satisfactory and you will be so thoroughly convinced that reversion to the old plan will be impossible. I thank you for the opportunity to push the good work along.

THE PRESIDENT: Our next subject is "Modern Sheep Raising," by Joseph E. Wing, of Mechanicsburg, Ohio.

MODERN SHEEP RAISING.

JOSEPH E. WING, MECHANICSBURG, O.

Mr. President, Ladies and Gentlemen: I have a big subject, and only a half hour to tell it in. There are so many different things I want to talk about. I remember very well how ignorant I was at modern sheep raising when I first started in it. I have been a cattle feeder, you know. When we were ranching in the west, and when we saw a sheep on the hill, we just passed him on the run. So I knew nothing about sheep, except that they had four legs and wool. I went back to farming in Ohio, a country much like this; the land of about the same price, and you got 35 bushels an acre and we 45. Conditions were very similar. Well, I went back there and started to feeding cattle on the old farm home. Cattle didn't pay very well; it was in the 90's, you know, and conditions were not just right. Finally I said to myself, here are sheep; a sheep has wool; wool sells at 25 cents a pound; I believe I would like to have some sheep. I just bought a little bunch of ewes. They were good ones; I had them selected by a man who owned sheep; he was a good man, and he picked them out for me. I went down to my little wife—she wasn't so little—we hadn't been married so very long. We drove down the old shady lane, between the rail fence; they came trotting along that old stone pike of ours—hadn't heard about Mr. King's roads then. The man turned them over to us; I gave him his money; I borrowed it, by the way. I came home with that little bunch of ewes; there was my little wife in the buggy; there I was walking behind that bunch of ewes; what more did any man need? I certainly was happy. I says, Florence, I am going to take these old sheep home, and I am going to treat them so well—that girl married me with some foolish idea—I had to borrow the money to pay the preacher when I married her;

she didn't know it. I says, "if we will just get started with this little bunch of sheep"—perhaps, if I will tell you how I started in, you will get some hints. I took them home and I took good care of them. In the spring they dropped me a few lambs, not quite 100 per cent. One dropped a lamb in January, and I took good care of that lamb. I kept it warm, you know; we nursed that little lamb all through until spring; what a buster it was. We named him Romeo. You know that lamb was so good and when fall came I sold him for $100. The rest dropped little ones; they didn't amount to very much through the summer; yet some of them thrived. The next winter I said, "I am going to do something; I am going to make these old ewes give me splendid results, and I am going to give them good care;" they were pretty ewes. You know I had been reading farm journals; I had been reading farm papers; read about protein. I said," what these ewes need is protein and bone matter." I hunted around the books and found an advertisement of wheat bran. I bought wheat bran and I stuffed them with all the wheat bran they could eat. Along in the winter—that wife of mine, she would go with me to hold the lantern to see the ewes. The babies were coming; they came fine and strong; they ought to—all that protein—they came fine and strong. But boys let me tell you, some came so fine and strong, they couldn't come at all. One of them weighed 17 pounds when it was born. The poor ewe died soon after; but the lamb was strong enough to take him in the kitchen. He would come under the kitchen chair and tip it over. It died, because I didn't know how to feed it on cows' milk. Then I had an old neighbor who raised sheep all his life. He says: "Joe, the trouble is with you; you don't want to stuff them all winter; that is what makes the lambs so awful big; no use to have them so awful big when they are born; just turn them out in the pasture and let them rough it; give the ewes enough exercise." I says, "all right, I can do that;" I do a lot of feeding of stock; so I just fed those ewes out in the pasture on wheat straw and corn fodder and sceneries, and stuff." When the lambs came in the spring, friends, I will tell you, they wern't too big; they came strong enough, but I will tell you where the trouble was; when those little lambs were born the mothers hadn't any milk for them at all. Well, it was really comical. The little lamb would be born, strong and all right; and you would go up and look at it and look around, and the ewe would say to you, "Joe, here is your lamb," and off she would go. She hadn't a single drop of milk in her udder. Then I learned the great truth that, if she hasn't any milk in her udder, she won't own it at all. Then I would carry out some cow's milk and feed it. (I had a string of ewes clear along the side of the fence of the pasture; it was a sorrowful time; (pretty trying for the ewes.) I learned then the great truth, if that ewe hasn't any milk in her udder, she hasn't got any love in her heart. Instinct told her that. After that I learned that those ewes in the winter time should be well fed, but not fattened. I didn't even give them all the alfalfa they wanted. I fed them a part alfalfa; that is splendid, or red clover. I feed them nearly all they want, and I don't want the lamb too large when it is born. There is danger in too much bone development. I want those ewes to be well nourished all winter long, but not fattened; and I want them out doors every day, so they may have a great deal of exercise, and shelter whenever it rains.

Now, our barns—you know in this country you can't keep sheep without barns; they are so well ventilated, just like being out of doors. We have doors with hinges on the top; we lift them up, and the air just goes through; just as well ventilated as out doors. Let those sheep have just all the fresh air they want; that is the way to keep them healthy and strong; never have any cold, or anything of that sort. How about the little lambs after they are born? The time to feed a lamb is when he is a baby. So when our lambs are born, as soon as they are a week or ten days old, we teach them to eat for themselves. We have a little lamb corner in the barn where the lambs can get into; a sort of a fence, just so the lambs can run through. In there we put the little troughs in which we put the wheat bran. Wheat bran is a mighty good thing, with a little cracked corn. The next thing is to get the lamb to eating it right away; they have to learn this. We take two or three little fellows, treat them kindly, and go in there and hold them and restrain them gently; take a little of that feed and put it in the lamb's mouth, and when he will get so he can eat, he will bring all the rest. We find the best feed for the lambs when they are yet babes, to be equal parts of wheat bran and cracked corn, with about ten per cent of oil meal. And then we give them always all the alfalfa hay they want; all the good, bright corn fodder they want, and an ear of corn—you know they love ear corn. We give them the cracked corn; we give them the cracked corn and put some ear corn in there too. Pretty soon the little rascals begin to shell off the grains; they will eat more ear corn than shelled corn. We have on the farm to-day something over 1,400 older lambs; they are all eating ear corn. They like it better than shelled corn. I am just telling you this to give you a little pointer.

What about these ewes with lambs? Now, we castorate them when they are young, not over ten days old. We cut their tails off while they are young also. There are several ways you can do that. These two little things are to be attended to while the lambs are young or else there is quite a loss.

You cannot have any profit in ewes that are ticky. Once a year we put everything on the farm through the dipping vat; it only takes a few minutes. Then when we shear them we take pains to cut that tick in two. I used to love to shear at home. If a man uses the shearing machine he cannot get the ticks all off.

Now, when the grass comes, about the time the lamb is born, if I was ranching or farming in Iowa, I would have them born in March or February, probably, and let them run around and take their ease until the grass begins to grow. Then I would shut them up in the yard and wouldn't let them out until the grass is really good. Why?

Because the first grass has nothing but water, no nutriment, and by eating that they wont eat anything else. All the cattle I used to lose died when the green grass came; we never lost any in the winter time, but when the green grass came the cattle died from starvation. That is the principle we go on, shutting the lambs and ewes up when the green grass comes.

As to shipping, in March and April I wouldn't ship at all, because the eastern market don't want them. I would feed ear corn and grass the latter part of April, and in June I would ship out every one that I had at an average of 80 pounds. This early maturity comes before the western rancher can get into the market. Then you know when the terrors of July and August come, you haven't any lambs at all, except the pure bred that are kept. All the rest have come and gone and I have got my money for them, and way above what I would get if I kept them until the western rancher got in. Some of them you must keep in the summer, and now there is trouble for any man who tries to raise sheep on eastern farms. Anywhere in the corn belt that trouble comes, the parasite question, the worms getting into the sheep. There is absolutely no spot that is exempt from this trouble. I found the neighbors had them; then we thought may be they didn't go west of the Mississippi River; now we find them in Iowa and in Dakota. I found that Robert Taylor had to go out of keeping sheep in Nebraska. I couldn't talk intelligently to you about keeping sheep without taking time. Now, on our old farm, we don't lose one a year and we don't give any medicine hardly. It is all in the management. I want to talk about proper management in getting rid of these worms. In the first place, you know these worms are carried over in the bodies of these mothers. In the spring time the mother deposits the germs on the grass with her droppings. These little germs in some way get on the grass, and the little lamb takes it in, and you know they will stick inside of the lamb better than the mother. The mother may look in perfect health, yet she may have sufficient germs to infect that lamb. Now, the remedy. Change those sheep from one pasture to another as much as you can, and then let the germs perish on the grass before you take them back. That is a sort of guess-work; you don't know how long to wait. We know that helps. Another remedy is the sowing of crops. Where they use the lands for grass or oats, they rarely become infected. I never knew any infection from alfalfa; they don't bite so close to the ground. On the blue grass pastures, you will find them almost deadly.

Now, have the lambs born early; we are able to wean them sooner and we take the ram lambs away; they have to be put on the fresh grass where no old sheep have been. So can we the ewe lambs, and yet they must be with their mothers. We don't often wean ewe lambs until their mothers dry up. We give them the freest reign we can while the ewe lambs are with them.

I went across the ocean to discover how to fight the parasite. I found, where the young lambs are given extra feed, they were more able to resist and able to fight the parasite in that way. And they give a lot of medicine. A man will go through and drench his whole flock.

Well, we sell everything in we have for market in the spring; never later than July, and have them fat and gone before the western ones come in. Just feed this corn with your good blue grass, alfalfa, rape and sowed oats; just make it a business of fattening them up and let them go.

There is another branch of sheep culture, and that is fattening lambs. We have on the farm now about 450 western lambs that we feed. I think we feed the best lambs in Ohio, getting right down to a nice little system. When I began feeding lambs in 1890, it was an experiment with me; I didn't know anything about it. I bought my first two hundred, I remember very well; I didn't know anything about it. I asked a man how he did. I told him the story about protein. I had nothing but timothy oats and straw, and I went and bought wheat bran. They did well. I fed the first bunch of lambs, every feed with my own hands. They did better for me than any have since. These lambs weighed 55 pounds in the barn in the fall, and 155 pounds when they came out in the spring. I said, "good; this thing of farming in Ohio is solved now; I can sell and feed all the lambs and put the manure back on the ground and make a little profit on it too; this thing is solved." So I went to work the next year. You know, I had to buy a part of the hay. Do you know when I fed 350 I made some money on them. I said to myself "some day, on this farm, I am going to feed 1,000 lambs." You know I didn't tell anybody that. "Now, this old farm is poor; I am going to build it up, put the manure back on it." Finally, on that farm I fed 500 and 700, and I fed a thousand on it. I was a proud boy. Finally I fed twelve hundred on that farm; that year they brought big prices. Now, on that same farm we have 1,400, besides the old ewes and little lambs. You know they increased the fertility of that farm,—by that system, feeding all the stuff that was raised on the farm to these blessed sheep, and putting the manure back.

I am going to tell you how we feed the 1,400; it is such a simple process. We feed them nothing on earth but corn and alfalfa. The corn is put in the silo first. We fill these silos with corn when the corn is almost ripe so that it comes out sweet and full grown; then we feed them alfalfa and corn. We buy small lambs with a good cross of mutton blood in them. This year, I think they weighed 50 pounds. We have had them weigh even less. The most money I ever made on them, was a bunch, I had to push them almost to get them to the ground when I unloaded them from the cars. We turned them first into a blue grass pasture for a day or two; we didn't turn them out to blue grass at all. It might be different in Iowa; we just let them rest up and feed a little bit. Then we dipped them with some strong solution of coal tar; we only dipped them once; just simply put them in and let them walk out. We never had the scab to break out after a thorough dipping. Then we put them in a barn and let them have alfalfa hay for 30 days; they just gently swelled, you know. By that time they got strong enough to feed them with corn out of the silo a little while, maybe a month. After that we began breaking up corn in two or three pieces and putting maybe one ear to a trough; and in maybe two or three days two ears to a trough; we just gradually increased that feed. The trouble is, by increasing too fast, they get dyspepsia and inflation of the stomach. By this gradual increase in grain, we don't lose any at all. I went to South Carolina three weeks ago, and my brother remarked when I came back, that we used to, when I first began feeding lambs lose six or seven per cent, because we used the self-feeders and they would gorge themselves. We just so gradually increase that corn, until finally, along about New Year's day, a little later than that, they get pretty near all they want—no it would be nearly the 1st of February until we finally get them to the point where they can hardly eat three grains more. By the way, we do the same with alfalfa and hay; we want to find it all eaten up. Now, we dry and cure it. Although it rained 33 days during one month we dried and cured our alfalfa. We found, under fair conditions, that a long feed pays best—a very gradual increase up to the ultimate point; you don't lose so many.

We shear them along the latter part of March; maybe the last week in March. We shear them by hand; we don't use shearing machines; we shear them and after that we keep them a few weeks more, and then we sell them to Buffalo. You know, they always look for our lambs as the best in the market, and they always give us a little bit more than the market.

I have been through some trying and discouraging times. There were years that I made so many blunders, and hung so many hides on the fence and did so many things I ought not to have done, that my brother and I would get on the sunny side of the barn and talk things over, and then we would decide that we could not afford to quit, and we stayed right by it, year after year.

Well, we fed the lambs regularly every morning and evening; they looked for it; always at the same time. We kept water before them always, and clean enough to drink. We gave them salt; all the salt they wanted. We either took a salt barrel and sawed it in two, or else gave them rock salt; I don't know as it makes any difference which it is. Then every nice day we took the manure spreaders and took the manure out into the field. I pay my men $1.25, and because they can get more in harvest, we pay them by the bushel for husking corn; and then because some day we couldn't husk, I paid them the same thing.

You know, I am going to tell you now why I like sheep and lamb feeding. Friends, when I came home from the west, and took hold of that old farm at home, it was a discouraging proposition. My father took down his account book and he showed me what hay he sold and wheat, and it all footed up a little less than $700. I had given up a good position as foreman of a ranch on which there were 1,200 cattle. You know my heart went down; if it hadn't been for the old gray-haired father, who was infirm, I wouldn't have stayed. But he said, you take hold and let me be the boy. So I started in. If it hadn't been for these blessed lambs, I don't know whether I would have stayed or not. But the lambs and alfalfa finally brought that farm out. When I came home my father had a little lame old darkey he gave $12 a month and board. On that farm we now employ three married men the year around. I tell you, one of them is a darkey, a young man with a fine family they have got boys; they are boys that go to school along beside my own; they have the same books and the same grub in their dinner. I am glad to see that old farm feed all these people. Most all the year we have three single men work too, and the farm keeps them all. Do you know, that is really remarkable. What has done it? Well, the tile drains were laid, and then the alfalfa went away down in the ground, absorbed the elements and made the ground rich; and then the lambs ate the alfalfa and gave us back the manure; so that every year that old farm gets better and better—really astonishing. So, sometimes, friends, when I go out over the place, maybe some Sunday, all alone, in the fall, go through the alfalfa, through the corn—this year we got almost 400 tons of hay, and husked 3,000 bushels of corn—I just feel so grateful for the goodness of God; not puffed up at all with pride; and then I think, we just sort of put ourselves in harmony with His laws; He knows how to enrich the land; we do the feeding and put the manure back on the land. The other day, my brother says: "Joe, come back here; don't you think a barn running from this end here, and shutting off the wind, don't you think that would be a good thing? Now, if we had more lambs, I wouldn't have to ship hay away and I could give more employment to these single men." I says, "where will it stop?" He says, "I don't know."

THE PRESIDENT: The paper is open for discussion.

MR. SMITH: Would the gentleman allow me to ask him how he cured that 400 tons of alfalfa, when it rained 33 days a month?

MR. WING: Well, we had to give some of it the water cure. If the gentleman really wants to know our system of curing alfalfa, I will give him the benefit of our experience. As soon as that hay gets wilted enough, so that it is tough, some of the moisture has gone out, and while it is still tough, so it looks dry, we rake it into small wind-rows. Now, we go into the field with pitch fork—I go myself, and my brothers do; we show the other fellows. We make these hay-cocks small at the bottom; don't spread them all out; lay one fork full on top of the other so the stems will droop down and throw the water off; a great big down-pour won't penetrate it; and then if the wind comes, good dry and strong, it may dry them all out; if it does not, you may have to spread them out. Now, if the hay is dry enough, so that when you twist it vigorously without being wet, we put it in the barn. If you are putting only a few loads in the barn, you have got to have it dry.

MR. SMITH: Does it ever mold?

MR. WING: No, we have a little horse stable where we put in two or three loads. When we put much together, it don't mold. This green color they talk about in Nebraska, about it rotting; I went out to see it; it wasn't anything more than you would see in curing tobacco; it just simply lost its color.

THE PRESIDENT: The next paper is entitled, "The Eastern Iowa Institute Organization," by Fred McCulloch, Hartwick, Iowa.

THE EASTERN IOWA INSTITUTE ORGANIZATION.

FRED McCULLOCH, HARTWICK, IA.,

No doubt those of you who attended the State Farmers' Institute and Agricultural Convention last year will remember that Secretary Simpson in his annual report recommended that some change be made in the managing and conducting of county farmers' institutes. The matter was not taken up at that meeting, but when several of us were returning home the subject was brought up and discussed and it was decided that one of our number should take the matter up by correspondence with the different officers of farmers' institutes in eastern Iowa and ascertain their sentiments, and your humble servant was selected for this task.

I began early in January to first try and find out who the officers were of the different institutes with which we desired to correspond, and I found this a difficult task, as the Department of Agriculture had no complete list, and it was necessary to take the matter up with the different County Auditors. I finally succeeded in obtaining the names and addresses of officers of eighteen organizations in east central Iowa.

It was then decided that a meeting should be called for the purpose of getting the officers of these institutes together to discuss the idea of forming an association for farmers institutes, and as Cedar Rapids was the most centrally located for the proposed organization the meeting was called for that place and invitations were sent out to the different counties requesting the institute officers to be present at the meeting set for February 28, 1905.

A great deal of correspondence was required in order to get the officers interested in the new scheme, and Mr. Simpson wrote personal letters to the different secretaries urging that they be in attendance at the meeting.

The day of the meeting arrived and eleven counties were represented. Mr. John Hamilton, Institute Specialist of the U. S. Department of Agriculture was present and gave his views of the necessity of central organizations of institutes, stating that Iowa was the last state to form some plan by which institutes could be held to better advantage.

After a thorough discussion of the matter a permanent organization was formed, and officers elected.

The purpose of our organization is to better the existing conditions of institutes, by first placing them in groups and circuits of four counties each, that outside speakers may be used from one to another at a saving of their time and expense. For example, a speaker has been called from the Agricultural College to address an institute in Jackson county one day and the following day he would be called to Mills county. His expenses would necessarily be very heavy, to say nothing of his having to ride all night, bumped around without sleep, and expected to speak the next day as well as if he had had a good night's rest. No one will dispute me in saying that under these conditions it is impossible to do good work.

The object in grouping them in four counties is to call that an institute week, enabling a speaker to leave home the first of the week, make four institutes and get back home the last of the week.

Another object of our organization is to encourage local talent, for there is no institute so good as the one that enjoys a great amount of local talent. Our very best institutes of today are the ones that have this home talent, as people feel more free in coming out in the discussions and greater good is derived.

Institutes should be made more educational instead of merely social entertainments, and we believe that organization will do much to further this end.

Another advantage organization has over the present system is that dates and location, as well as speakers, can be selected far enough ahead so that the institutes will not have to be made up in a day or two, as is now being done by many officers. They will have to decide what subjects and speakers they want, and their dates will be set far enough ahead so that they will be more known and a better attendance secured.

More time should be taken, than most institutes now give, in selecting their subjects, for as a general rule the local officers wait until the very last moment before they decide what they will have, and then the time is too short to get the best talent, or some other institute has secured the speaker they desire, and they have to take what they can get, while if some system was used they would have to make known to the proper officers what they desired and speakers could be secured for them in time.

Now, as to how and where an organization of this kind, if extended over the State, should be placed, I am not prepared to say, but think it should be an organization of itself and some one placed at the head of it who would be capable of handling it.

If it should be extended over the state it would require a large amount of work to get it properly started, but when once in working order our institutes would begin to do a better grade of work than is now accomplished.

It is my hope and desire to see other organizations similar to ours extended to other parts of the state.

I do not want to see control of the institutes taken from local hands, for they should select their own local program, but it seems quite necessary that some central organization be established so that outside speakers can be procured with much less expense and loss of their time.

I should like to have this matter taken up and discussed here so that we may get the sentiment of those present as to what they think of the undertaking.

So far we have been quite sucessful with the work of our organization, but is too young as yet to get all the benefits. Nearly all of the counties in our association hold their institutes so as to come one after the other and those that have been held up to the present time have had a great saving of time and expense. For example,—Iowa county held two institutes, one at North English and the other at Williamsburg, and total expense for Prof. Wayne Dinsmore of the Agricutural College, who attended both meetings was eleven dollars.

It seems to me that this is an important question for the future success of our institutes, and I hope that you will all give it due consideration.

THE PRESIDENT: We will now listen to a paper by Hon. F. D. Steen, of West Liberty.

MR. STEEN: Glancing down on the program and just looking at the watch, I will say, that in the early times, when log houses were being built, and these large places between the larger logs were sought to be filled up, the workman used smaller logs and chips to fill in these spaces. I presume, when the president looked at the program, he concluded to call on your humble servant. We are thankful that we can be used to fill in these spaces.

VALUE OF CIRCUIT ORGANIZATION AND CO-OPERATION OF FARMER'S INSTITUTES.

F. D. STEEN, WEST LIBERTY, IOWA.

Circuit organization and co-operation of institutes is of value

1. To the management of the local institute.
2. To the institute worker or the person from eyond the county, who addresses the local institute.
3. To the people of the local institute.
4. Indirectly, to the producers of the state and, hence, to the entire commonwealth.

The present institute organization of the state is confined almost exclusively to county lines, or at best only to such and contiguous territory. The local institute management fixes the date and place of holding the institute, and then tries to obtain outside help that is available and is known to the local officers. Great difficulty has been experienced by these persons in securing speakers, and the consideration of having the proper speaker suited to a fitting topic for the locality, has to be dropped very often entirely. The local manager is mostly very well satisfied when he gets outside help at all. He does the best he can in the very limited sphere in which he is familiar, to obtain speakers. He can hardly select topics that are suited to his people and then find speakers who are the best suited to those topics. He learns that other counties have already engaged the men he wants for that date; for there are many institute managements in the state, and each operates for itself, each tries to get what is deemed best for its own locality.

In the present arrangement the local institute is supreme; the state at large knows nothing of its affairs, nothing of who is to address it, nothing of the date of the meeting, nothing of what questions are discussed, and generally, the state does well to receive enough of a report from the local institute, so that the necessary funds may be forthcoming. In short, the institute work in Iowa is organized along strictly democratic lines, using that word not in its ordinary political sense but in its dictionary meaning, namely, each local institute is entirely independent and supreme to say and do what it wants to.

Now, this would be well if it brought about the best results. If it gave to our people such efficient work in the lines indicated no one would think of any change. But Iowa stands far in the van of agricultural interests and thought and I believe that in the institute work we are far from getting the benefits which we might derive therefrom if a somewhat different system and management were to obtain. I would be the last to do or desire to do anything that would detract in the least or injure in any way the splendid work now being done in this line. But I believe that much more can be done with our present help and even with the present funds if only a little more system were infused into the work.

And what shall that system be?

My topic suggests circuit organization of institutes. I believe that institutes in a number of counties, contiguous and accessible by the means of communication, could hold their sessions at rapidly following dates one after the other. Outside speakers could attend three or more institutes at one trip. Inconvenience and discomfort in travel to these speakers would be brought to a minimum. The expense account of the institutes would not go so largely toward car fare and much more work could be obtained for the same outlay. If there were some outside management, the speakers suited to a locality could be sent there. For instance, the speakers familiar with dairy topics could be started along some line of railroad or part of the state where those topics are live ones and the institutes in such part could be arranged that these speakers might make a campaign there short, decisive, and efficient, and at the same time economize in money and time, and more, they could conserve in a very large degree the health, the time, and the efficiency of these speakers. This is not all. The people would hear discussions of their work that the local management could not obtain for them. And still more, counties, which do not now have institutes at all, would find themselves surrounded by, and in the path of these institute evangels, and they would soon also organize for this great work. Still more. A central or outside management with an experienced eye could attend in person many of these institutes and discover talent, now latent, that could be brought out and some of it could be encouraged to be used in larger work over the counties of the state. We have men and women with talent, who would, with a litte judicious prompting and instruction, become of much help to our institutes and re-enforce the line of present workers.

Many other benefits and advantages for the circuit organization of institutes might be mentioned, but I desire not to be tedious, and will say that I would retain as many of the good points of the present organization as possible; but I would handle and supplement them by some sort of system that would work larger efficiency and more general institute work. Also, that would economize and conserve not only our funds, but also the time, the talent, the comfort, and the patience of the splendid men who go out and act the part of the institute missionaries.

Such system or management I believe to be workable in a district composed of, say, one-fourth of the state, or it might be expanded to cover the entire commonwealth. Let us by all means retain our home organizations, but let us have a little of the central authority, to give to our efforts intelligent direction and larger returns in many ways than we now get from the work.

The splendid agriculture of Iowa, handled by a splendid agricultural citizenship demands the infusion of larger measures of intelligence into the farthest corners of the state. Great are the blessings and the prosperity that have come to us. They carry with them commensurate responsibilities. Let us learn to appreciate as fully as possible these blessings and we will then be better fitted to deal with the responsibilities that accompany them. Let us have better institute work that we may all be better farmers, and better prepared to occupy the place that is expected of citizens of this splendid commonwealth.

MR. WING: Are your institutes organized under the laws of the state?

MR. STEEN: Yes, sir.

MR. WING: Does the state give you some funds?

MR. STEEN: Yes, sir.

MR. WING: And yet you are independent?

MR. STEEN: Yes sir; they do their work entirely independent; but they have to make some sort of a report.

MR. WING: I can readily see that you are in great difficulty in arranging a circuit. The reason I am interested in this, I have a great many requests to come to Institutes in Iowa. Now, it would give me a good deal of pleasure, sometime to make a little circuit in Iowa, just because I like your people. It seems to me you must have this circuit you are asking for before you can ever have your work arranged. It occurs to me they should run along lines of railways. Why couldn't you have a convention of institute managers and arrange a series like the fair circuits?

A MEMBER: I have attended institutes in Iowa, ever since they were organized. While I am an uneducated man, I have been identified very closely in Calhoun county, Iowa, for 25 years, and while I am sometimes accused of being on the contrary side I am certainly contrary today. While the gentleman was reading his paper, I thought of the Northwestern Iowa Horticultural Society; I believe that takes in about one-fourth of the state; that is carried on somewhat under this central organization. That society will make its announcements sometimes two or three months ahead of time. I have attended some of those meetings. I have found some of the most thoroughly posted men in their line of work. My disappointment has always been, at these meetings, that I could count these men on one hand; there were not to exceed 15 men from Calhoun county in the meeting.

We organized an institute three years ago. At that time we started without any money, but received a state appropriation of $50 that year. We held the meeting in the court house; we succeeded in getting a full house. The first year we had no money to give premiums. We organized with the understanding that everybody had to be a practical farmer to become a member; we paid a membership fee of 50 cents a year. Since that time we have had a premium list; we have gradually increased it. Last year we paid out $300 in premiums. The question with us is, how will we hold the crowd down. This year we intended to have the court house for exhibits, and have the opera house for speaking. Yesterday, before I came here we had a little talk with the banks and business men's association; how we could accommodate our men. Last year hundreds went away. We decided we are going to issue tickets. This is simply to have the men come that will be interested.

In regard to fixing dates; the first thing to take into consideration is to know when the people can attend. The next question is, can we get the buildings at that time. After looking into these things very thoroughly, I find that the institute in Iowa is not practical before the 1st of January. We can get retired farmers and a few politicians; we can get a few school professors; but we want young men; men that are going out into life. Before the first of January we cannot get them.

MR. WING: All of your part of the state is in the same boat?

Ans. Yes, sir.

MR. WING: Then why can't you put them all after the first of January?

Ans. Well, the opera houses are pretty well taken by lecture courses and different things. It becomes necessary that we should be thoroughly posted along that line. For instance, we have a local insurance association local horticultural society, stock breeders association, poultry shows, and there are a great many things that conflict with this centralization of things. I am here to say, and I say it honestly; I think Calhoun county will bear me out in this; I have spent a good deal of money; and if it is left to a central board to fix these things, a large part of the appropriation we now have will be spent away from the county, where it will do us no good.

Another thing I will say, and that is, at the present time, the first cost of the machinery it takes to conduct my farm is probably about $4,000. If I take the same view of it, in regard to centralization—for instance, one binder could be made to cut 200 acres. I have a threshing machine to do my own work; not because I couldn't get a threshing machine, but because I couldn't get it when I wanted it. And it is so with institutes. In regard to getting public speakers, I have no trouble. We hold our institute the 23rd and 24th of January. We have on the program for months, a Mr. Wilson from Ames; we have Governor Cummins to speak in the evening; we have the assistant Dairy Commissioner; we have Mr. Morrison of Wallace's Farmer to speak to us; and we are working now to get a gentleman from Northwestern Iowa to discuss the abuse and use of pedigrees. I will say this, the public speaker must be inconvenienced to some extent, and I would rather pay double my appropriation to what it costs Calhoun county for car fare, to know that I can get a public speaker and have him there. I believe that this agitation at the present time of centralization in Iowa does not come from the practical farmer, but it is coming from a class of men who are desirous to get hold of this $75 to the county. I was a young man who never received the benefits of a school education; my views of farming have been largely formed by reading agricultural papers and attending farmers' organizations. While I think I have attended when it was a great sacrifice, I feel I have not only had returns, but would hate to see anything done in any shape or form that would in any way decrease the interest now manifest in local organizations.

MR. VAN HOUTEN: Iowa has tried the central organization and don't want it. The central organization was in effect so long ago, that the only one alive was father Clarkson, who is now dead. Col. John Scott is dead. Lathrope is dead. Fitch B. Stacey is dead. President Shafer is dead. They were the members of the first organization of central institutes in Iowa. After that first central organization was re-organized, I had the honor of being the Secretary and Manager of that concern for four years, and while I can say that the advantages are many, as said by the gentleman, and as shown by Wisconsin and many other states, the people of Iowa don't want it and won't have it. So there is no use to urge it in Iowa. The people don't want it, and as long as the people don't want it, let them keep what they have.

MR. D. WARD KING: Now, I don't want a piece of that $75, nor do I believe in the cause of an iron clad, rigid central organization; but gentlemen, I have traveled in some 8 or 9 states, and I will tell you Iowa people, and I told the Kansas people, that in my opinion you are making a mistake by not having some central management. There is a difference between central power and central management. You cannot get the thing you want in this state without some central management. You want Mr. Wing. You haven't been able to get him.

Now, there is another thing I want to say to our friends; you will pardon me if I speak to the point. There is a misunderstanding here between you people who insist on having what you think is local power, and these people who want to have central management, because I don't think there is anybody here who talks about central power; you don't want that. There is just as big a misunderstanding here as there is between the stone road men and the mud road men. One man declares he won't have stone roads. I will tell you that the farmers of Iowa need stone roads and they are getting them; on the other hand you have got to have tile under it; it has got to cost ten thousand dollars a mile; there is no use to talk to me about a road that is not built that way.

Now, there is a place between the two means. I want you to understand I am a practical farmer; I am not a theorist; have been living on one farm for 26 years. I told Mr. Wing today when eating dinner, that this was the first time I had been home for six days that I didn't get some of the colts broke. I have trouble in Kansas lately, and I have trouble in Iowa. For some reason Mr. Wing has trouble in Iowa and Kansas. I cannot afford for the money you pay me to spend two or three days laying around to attend a meeting. You cannot afford to pay me.

I got on my feet and I am talking a good deal longer than I had expected; but I wanted to explain that it is not a question of power, it is a question of management.

MR. FRANKLIN: I desire to say a little, and very much along the line Mr. King has been talking. I take issue with him on this one ground. The people of Iowa would pay Mr. Wing in order to get him. We haven't any difficulty in getting speakers when we hold an institute, as in Calhoun, or down at Mt. Ayr, or a dozen places I might name; the hall won't hold the people They have a little organization of their own; in addition to that paid by the state, they pay a membership fee. It has been tried in Iowa, as Mr. Van Houten has said; they won't have it. The county has its organization and they are going to stay right by it, and if they can't get one man, they will get another. We are getting more every year.

A MEMBER: This organization does not want to lay down any cast iron rules in regard to getting up a program. All we ask them to do is to send in their dates and the subjects and the men they want, and we will endeavor to get these men, and assign those dates and subjects to conform to those counties as near as it can be done. We don't want to lay down any rule of that kind. In all the counties they ask for outside help, and I think nearly all ask for college help. We couldn't supply them all. We have some seven or eight days to fill those paces for college men. Now, it took considerable correspondence to get Mr. Ames. The idea of the association is to try and hold them so that we can get them at less expense.

MR. ADAIR, of Butler County: I have had some little experience in institute work. I was at the "borning" at our institute in Butler county and have been in with it since. I am proud to say it has been very successful. I think it was Prof. Holden who mentioned the fact it would be very nice if they could form a circuit in a few counties, so that the speakers could be of more benefit to the people, and the reason that he brought that matter out was, because the day before he was to be with us he was at Clarinda, in Page County. Our institute that year was held in Parkersburg, Butler county; he had quite a distance to travel, but he was with us nevertheless and did a great deal of good, and the next year we followed his advice and formed a tri-county institute organization, consisting of Butler, Bremer and Chickasaw counties, and since that time we have held three institutes in one week and have been very fortunate in getting outside help and have had good meetings. We have had such men with us as Prof. Marston, Hon. John Cownie, Prof. Holden Mr. Wilson, and a great many others. Also we were to have torms with us last year. We did have Storms, but it wasn't A. B. We had our meeting in February last year, and the entire week was stormy; but some of my brothers will tell you that the largest howl was that people could not be accommodated that night, and 200 people could not get into the institute. I think these small institute circuits are all right; I wouldn't favor large circuits covering one-fourth of the state.

Mr. Steen: Inasmuch as I have read a paper, advocating new thoughts and inasmuch as some have tried to assail the thoughts I tried to introduce, I beg your indulgence. I am sorry that gentlemen on this floor have used such words as "won't"; they said that idea has been tried and found wanting and it is bad, and that the people of Iowa *won't* have it. No one on this side of the argument has sought to say that you shall have it. We have tried at least to be frank and fair, and charitable, and we have simply asked for a little more system and management, and not that you shall have such a program at such a time and place. Now, let me tell these gentlemen, that we lived in the 19th century, and we said we *won't;* and now we live in the 20th century, and we are making progress; we are not content with present progress; we must have larger progress; we must have larger progress. We must not sit down in our little county and say, we have splendid progress. Now, if by a little bit of management and infusion a system of some sort we can supplement that by larger efficiency, why not? I will tell you, as I stand on this floor, I was present when the institute law of Iowa was born. There were five men in that house who said, we must have some institute law, because the majority were farmers. I am not content with present conditions. Let us see if we cannot do a little more along the lines of Iowa farming; let us see if we cannot get such men as sit on that front row of chairs to talk to us without somebody saying we are trying to get our hands on that $75. I want to say, I am proud to stand here and say that I own an Iowa farm. No man on this floor shall say we have not at heart the true interest of the Iowa farmer. I want to say, these ideas ought to have died with the other century and that we are now looming up with larger possibilities. It is not possible for you to confine yourselves merely to county lines. I know what I am talking about. We have already saved much wear and labor for the local organization, and we are receiving compensation along the line we are establishing.

MR. WING: I have done a little work in eleven states. You know you men have got the right way here, with a little modification. It is a hundred times better for you men to get up an institute than to let some central man do it. In New York state they had that very thing. The New York people are bright and nice fellows. The local fellows say, they are going to sent us an institute after a while. When you go to work and dig out an institute yourselves, you relish it; it does you good. But Heavens, it does seem to me there is a middle ground. Why it would give me joy to spend a week or two weeks with you. You know the hardest thing on earth is to go to a meeting somewhere, and then go and sit in a hotel a few days and wait for another. It is true you have got lots of good men in your state. A local man, if you can get him on his legs to talk, is a valuable man. I was thinking about some men I knew. There is Van Alstine of New York, a great big hearted fellow; one of the best dairy teachers in the country; he worked his way right up from the ground. You could get Van Alstine; it might cost you maybe $50 a week. I could go over the list of fellows from Ohio, Nebraska and all over; men whom you all know; they could come for a month; but they coudn't come for a day.

Don't you know, boys, all I have got, I got from coming in contact with some other man and things. I remember when I was a child I heard a lecturer; he gave me a new contact, new impulses; I dreamed a dream; I got a new idea as to what a man might be—that man didn't grow in my barn yard, or my neighbor's either. I believe it does help to get the very best men you can get, if you can just arrange it; you can have a succession of counties lying close together, and then sort of agree on some men you may desire to have.

A MEMBER: It has occurred to me while Mr. Wing was speaking, although we seemed so far apart, in the discussion this afternoon, while some think they don't want the power of fixing and arranging of institutes to go to a central authority, yet I believe, all that is asked for, is for a co-operation in fixing dates for the counties. There isn't much between us after all.

(Editor's Note.)

*It is very evident from the discussion following Mr. Steen's paper on the "Value of Circuit Organization and Co-Operation of the Iowa Institutes" that the thought which we wished to convey was not understood by all. We take it that Mr. Stein desired to bring out the benefits to be derived in holding a yearly meeting of the several institute officers in the different sections of the state for the purpose of exchanging ideas and plans for conducting the most successful institutes, and incidentally to try and arrange the dates in the several adjoining counties that some speaker of national reputation could be secured at a greatly reduced expense. While it is true that some of the older and more permanently established institutes have little trouble in securing outside help they should not be selfish and unwilling to assist in whatever way they can others who are not so fortunate. It is not necessary (nor is it suggested in his paper, that the present institute law be either amended or added to) to bring about a meeting of institute officers in the different sections of the state. This idea is followed out in nearly all lines of business; bankers holding district meetings for the purpose of discussing the banking business, and implement, grain dealers, farmers co-operative associations, fair associations and many others hold meetings to discuss their several different lines of work, and why not similar meetings of your institute officers? If you cannot gain greater knowledge by mingling with your fellow men and co-workers you may at least be able to impart to them thoughts which will assist them in doing more efficient work.—Editor.

THE PRESIDENT: We will now have five minute talks by delegates on the following topics:

(a) Plan of organization. (b) How dates and location of institutes are settled. (c) When dates and location for holding institutes are settled. (d) Number of meetings held. (e) Amount of money spent. (f) Number of outside speakers employed. (g) By whom are your programs made up? (h) Do you have a woman's session, and do you invite the wives and daughters to attend? (i) Do you make any special effort to reach the boys in the arrangement of your program?

MR. MILLS, of Story County: I think that the matter of getting outside speakers is a fine thing, from the fact that they are interested in the subject. A good many farmers are not accustomed to speaking in public. When you can't get them to introduce a subject, I think by getting outside speakers like Mr. King, Mr. Curtis, Mr. Densmore and others, to read a short paper, it introduces the subject and the farmers will get up and ask questions, and the first thing you know you have the whole house interested. I think the outside speakers should be assigned subjects by the local organization, which knows what they want there, and not let an outside organization make up a program and send it to us and make us work by that program.

MR. ROY WEST, of Polk County: I have prepared a brief plan for organization and will present it now. In the first place, a dozen or so of our farmers met and proposed to form an institute; we discussed the question between ourselves as to the good it would do and decided to perfect an organization, which we named the Polk County Farmer's Institute, composed of not less than forty members who shall be directly or indirectly engaged in agricultural pursuits, and none other are admitted to active membership. I will say, at present, we have a membership of 184 paid up members, for which we charge the small fee of 25 cents.

The offices of our organization consist of a President, Secretary and Treasurer, and three members, who shall constitute the executive board—one from our local members at Bondurant, one from Ankeny and one from Grimes. All officers are elected at the last meeting in December of each year.

We have three locations in Polk County to hold our institute meetings, and elect one member of the executive board from each point, so as to have an active chairman to call previous meetings, in regard to fixing dates, electing committee on program, finance committee and committees on the different exhibits, and all necessary arrangements for speakers.

Now, in regard to the amount of money spent,will say, that last year we spent close to $100 at Bondurant. We gave $86 in prizes at Bondurant; $65 in prizes at Ankeny, and $31 at Grimes. Of course, there are other expenses to be met, such as hall rents and fees to speakers, etc. We employed six outside speakers last year. Our programs are made up by the program committee, elected from the members of the institute at one of our previous meetings before the regular session, which we generally hold a month or so before that time.

I would like to say a word of praise and appreciation to our Iowa State College at Ames for their help. We have called upon them and have had the great pleasure of having Prof. Bousky on the Dairy and Butter question; also Professors Gay and Dinsmore on corn, and Prof Chas. Reinbott on Seed Corn, after which they judged their respective classes. We also had Prof. Todd of Atlantic give us a talk and he judged our poultry for us.

Now, these talks and lectures were followed up by spirited discussions and were very interesting and of general benefit to all. We always have a woman's session; generally a half day or so, on some topic, in regard to home life and domestic economy.

Last year we gave prizes to the boys and girls who wrote the best essays on the advantages of living on the farm.

The object of our organization is to unite the farmers to assist each other in fostering and protecting their interests, and by the exchange of ideas, and the discussion of questions, educate ourselves in the most improved methods of agriculture, horticulture and animal husbandry in all important phases; and to increase our efficiency in domestic economy, home life and good citizenship.

MR. THATCHER, of Page County: I simply want to say, that the greatest trouble we have had, was to get the crowd out. I find as time goes on, there is a little rivalry springs up. Our programs and dates are fixed by the executive committee. Last year we held our institute at Shenandoah; we had a corn show in conection with it, and also a stock judging school. We had three outside speakers from Ames, and Mr. Atkinson of the Homestead. It cost us about $261, I believe, in money, and about $140 in implements. The way we did this, we started out with a subscription paper. As to getting the boys interested—well, I am on this subject like I am on the liquor question; they will drink until they are dead. We gave some premiums amounting to about $30 to the boys. Almost all of the boys over the county came in with their corn. We arranged the premium list so that nearly all the boys got something.

Of course, we couldn't get along very well without the ladies' session; that comes the last day.

THE PRESIDENT: We have with us today the first lady delegate that has ever attended a farmers institute here. Mrs. Hurlbut of O'Brien county. We would like to hear from her.

MRS. HURLBUT: I want to say to you right here, that I didn't expect to be with you in this session. Our delegate was Mr. Zimmerman, of Sanborn. He was taken sick with rheumatism. He wasn't taken sick quite soon enough, because he didn't give me time to get ready.

I may perhaps tell you how we organized our woman's session. Of course, we got off by ourselves in the court house; we didn't want any of the men folks around at all; we were afraid of criticism. We elected a president—we call them vice-presidents—for different parts of the county. We elected one in the southeast, one in the southwest, one in the northwest and one in the northeast. We had those presidents send in to the secretary the names of people whom they thought were capable of doing the work we wanted done.

MR. WING: Did you give every woman an office?

MRS. HURLBUT: We tried to.

By the way, we had Mrs. Squires, from Spencer with us. I think the Secretary is acquainted with the lady. She did our work of organization.

As to the dates of our institute, I will have to tell you how we do that. We generally decide on a day we would like; then we try to get our outside help, and if we cannot get them on those dates, we change them, regardless of moon-light nights or anything else. I will say, our dates for this year are the 7th, 8th and 9th of February; subject to change, however.

We encourage local talent as much as we can, for two different reasons. We realize, if we do not encourage local talent, we will be embarassed financially. We prefer to have such local talent as we can, in order to bring out all the material possible in the neighborhood. We will have a woman's session this year again. Last year was our first.

A MEMBER: On what day of the program do you have the woman's session?

MRS. HURLBUT: They gave us the choice. I don't know how it will be this year. By all means, we invite the wives and daughters to attend. We make a special effort to reach the boys, and the girls too. Our institute was more like a fair last year. We had premiums offered for cake baking and sewing.

I will have to tell you about the way we get our premiums. These vice-presidents, canvass their part of the county, to see what the store-keepers and bankers, or any one who was willing to subscribe or donate would give us. We had dishes, a set of furs and all such things as that. I think one lady gave a pair of Plymouth Rock chickens. Everything, in fact, was acceptable; we had just a little money donated to us.

MR. WING: At the woman's session, were they all ladies who spoke?

MRS. HURLBUT: Yes, sir.

MR. WING: The men were allowed to come in, were they?

MRS. HURLBUT: If there was room, the men were allowed to come in. I think I have told all I know, and perhaps more too.

MR. STEEN: I know that you are tired; I want just a few minutes in reference to the woman's session. I live in Muscatine county. We have had farmers' institutes doing work there for 14 years. At a very early session of the institute in that county, there was organized at that time a Floricultural Society at West Liberty and the surrounding country. This society prospered and has grown in wonderful proportions. They have their regular discussions about flowers and all those topics along the lines of woman's work. Now then, as that society has grown, and the farmers institute meets from year to year, the institute regards that Floricultural Society as its offspring. They send us every year a lady to talk to us about flowers in the home. Along that same line, the farmers institute turns over to the Floricultural Society one evening session. We tell them to make up their session as they please, and we pay the bill. We asked Prof. McBride to come down from Iowa City to talk to us about flowers and home adornment. I believe, in some sort of a measure the Muscatine Institute has made this matter of a woman's session practical; I believe we must not neglect it.

MR. FOSTER, of Monroe County: We organized an institute three years ago. We had no place to meet, so we hired a hall; that hall wouldn't begin to hold the people. We organized by electing a president, vice-president, secretary, treasurer and an executive committee. Unfortunately I was the president, The executive committee got up a program, and in connection with that, I want to say, we have agricultural papers, bulletins of every kind, and literature, that is full of information. The reading farmer, if he is so disposed, can get up a very intelligent paper. Our program covered the different topics; we had essays, and prizes. We solicited from the merchants. It was a grand success.

The second year we couldn't get the court house. I stood in pretty well with two of the members. I told them this place belonged to the public, the tax-payers built it, and that they had a ladies' rest room for the ladies especially; that we were compelled to come and pay our taxes, attend court, and so on. I offered to pay the janitor fees and expenses. We went there. The courthouse wouldn't hold the crowd.

We had essays and declamations. Penn College gave a premium of one term tuition for the best essay. Albia high school gave a premium; the merchants gave premiums. In that connection, I want to say, we reserved the right to sell the corn. We had an auctioneer to sell it. Ten ears of corn sold for $4.

We hired our large opera house, but that wouldn't begin to hold the crowds. We charged ten cents admission. Of course, nobody will stop on ten cents admission. Why, the boys and girls there just beat everything I ever heard of. I want to say, being the treasurer, that we have between $70 and $80 in the treasury.

Along the line of talent, we made arrangements for Prof. Holden to come down. He sent a substitute. We appreciated his talk on corn; it did us lots of good.

I think the Central organization perhaps will be all right. I think we have men down there that will get up a program that will suit our people pretty well. If we haven't outside speakers we go over the county and say to the men, "See here, you must come." We want harmony in institute work. We had one man from Mahaska county come over there and read a paper. He advocated the Jersey cow gave richer milk and more butter. Of course we didn't agree with him; but then we had lots of fun. We have principally short horns down there.

MRS. HILLIS: I am going to make an appeal to the Farmers' Institute for our education in the home and for the children. I think I can say something in regard to circuit work and how speakers are accommodated, as well as travelers. Last year and year before last, it was my pleasure to visit a dozen or more of the institutes. I know something of the pleasure Mr. Wing spoke about, sitting at the hotel all day.

But do you men know how hungry the women are for woman's work? They are simply thirsting for it. I know it from experience and letters I receive. They don't want to study only the flowers. It is a beautiful thing to discuss them. But the greatest problem of the farm has not been mentioned here today, the children. If the same intelligent care is given in the production of the child, both before and after its birth, in the bringing up that is given to the breeding of lambs and corn, then we will do a great work. As our other friend said, we live in the 20th century, when the opportunities for boys are getting so different, and it seems to me we want to emphasize the dignity along agricultural lines and have something attractive all the year around, which will make farm life attractive. So I want to add a word in favor of a woman's department; call your women out and get them to work. Let them meet every two weeks, and then next summer we will make the great State Agricultural Fair the central dumping ground for all the ideas gathered up for the year.

The only fault of this meeting today is that you haven't brought your wives along. Do try next year to so enthuse the woman's department that you will have 40 or 50 women delegates to the State meeting.

A MEMBER from Dickinson County. I cannot make a speech in public. I would like to say a few words to emphasize this truth, that we are neglecting to a great extent too much the most important part of our existence, these boys and girls. They are the most important crop we raise on the farm. The matter of this woman's session of our institutes, I am sorry we haven't more time to discuss. We have had that in the last two sessions in Dickinson county. We hope to continue it. I cannot say half what I would like to; I forget when I get up to speak. But let us all remember, that in the years' work to come, to give our boys and girls the very best of opportunities. If we fail ro raise a family which will make its mark in the world, we may conclude that our lives have been a failure.

H. C. WALLACE: There is a gentleman in this audience who has organized 600 boys and 500 girls. I don't think you can hear from anybody with more profit, than Mr. Miller from Keokuk county.

MR. MILLER: I would like to talk to you, but I fear very much, if I once get started, I will be unable to quit.

I appreciate this great honor. I am deeply interested in the boys and girls. I have realized for a long time that the farmers do not do as much for the boys and girls as they perhaps should. When I was a boy I used to think there surely ought to be some things to brighten this life, and when that old freight train used to go by, I used to wonder if I would ever get a chance to ride on it, and what in the world it was that made it go, whether I could ever investigate that thing to see what it was made of. It has been my great pleasure to get hundreds of boys and girls and to get on that train, and go where they have the beautiful green grass where they teach the boys how to farm, and where they teach girls how to sew and cook, and things that they have to do. I got to thinking about these things in connection with my school work. I was looking through the Code one day, and I saw there a provision for the farmers' institute. I discovered this while I was looking for some school law. I saw it would be posible for us to get $75 to run a farmer's institute; so we planned one. If it hasn't done any other good, it has started the boys and girls to doing things along agricultural lines. If you will look in the last Year Book from Washington, D. C., you will find there a whole page devoted to what our boys and girls have been doing.

A man told me today he didn't believe in agricultural training; he believed in nature study; nature study as it has been taught in the past. We have been having our boys and girls write about pea-nuts, pumpkins, and things they know about. If there is anything detestable in our school system, it is to write about "success in life," "character building" and other such subjects. Here a while back a large crowd of people gathered to listen to the boys and girls on the subject of plants, and as these boys and girls came to the platform and gave those compositions before the audience, and after the judges decided the contest. Joe Trigg who was sitting back there, he got up and said, that he had been a teacher at one time, and for a considerable time, and whenever the time came that a girl nine or ten years of age, can come upon the platform, and grow eloquent in telling about a cabbage, that then there was something added to our school system; the study of a plant and writing about it. There is a natural order in the development of a plant, which, if a child writes about it, teaches and instructs it. To write about life and character, they don't know where to begin. But you ask it to write about a pumpkin and when the task is done, the mind will have developed some.

One reason why agriculture ought to be connected with school life, it doesn't require a text-book; there is not required a large list of difficult and technical names. Another reason is, it furnishes its own laboratory. When a boy sees a bird flying through the air, and he gets his rubber gun and shoots it, and when that bird strikes the ground with a flop, that is what suits him; he does not want to hurt it. When he puts a can on a dog's tail, he doesn't do it because he wants to injure the dog; it is because he wants to be doing something. The father comes around and says. "John quit pulling that cat's tail." The boy will say, "I am not pulling; I am simply holding on." When all that performance is going on, it isn't because he owes any man any ill will. He sets a pin for his best boy friend at school; yet he has no ill will for him, but because he wants to do something; he wants to see the boy jump. Teachers make a great mistake thinking the boy has an ill will. If you can furnish that boy a laboratory, instead of his pulling the cat's tail he will apply his energy in that direction and something valuable is added to our school system.

I would like to talk to you people a long while, but they call me a crank all over this country. We have got the boys and girls to spell again. I have prepared a list of one thousand words and we have spelling schools galore. I will tell you, I woud rather be called a spelling crank than most any other kind. The President of the Iowa State Normail School came to me one year and said: "That spelling down there is one of the best things that ever happened."

Not long ago we were able to receive a sack of Yellow Dent corn for our institute members; they are now bringing it to township exhibitions. We have township exhibtions. We had Miss Hull make a talk for us and we charged admission; we came out ahead. We are now working to have a big county exposition. I really didn't come up here to make a talk; I came up here trying to get somebody to help us in that exposition. The thing is started and on its feet.

Not very long since I listened to a sermon of the presiding elder of a Methodist church. As it happened, on going home to dinner I met the minister. I had met him before and in the course of our conversation he said: "Young man, did you ever stop to think, when you teach boys and girls, when you are having them plant corn and seeds and write about them, that you do things according to God's plan; you certainly are, and that is the reason I am in favor of the things you have been doing." In addition to that, he said he was carrying in his pocket a considerable time one of these Ames ears of corn. That just made me feel like the fellow who had been going to see his girl for six years and he didn't have the courage to ask her to marry him. Finally he got to that degree where he had the necessary courage to ask her. She said "John, I would be glad to have you." It was a beautiful night; he didn't even stop to caress her, but opened the door and slammed it shut, and as he was going along in the heighth of his intoxication, he looked upward and said: "O Lord, I aint got nothing against nobody." That is just the way I felt after hearing some of these people tell me these things. I would like to talk to you longer, but I cannot take your time. I thank you.

MR. WING: I would like to say a word. I was extermely interested in this talk, and I know it is the very best thing. In the early days, when the boys came out on these prairies, they were heroes. What about the boys today? Now you are going to be well off, and now is the dangerous time for the boy. He has comparatively an easy time; but that boy will degenerate unless you teach him higher things; get closer down to the real truth, so he may know something about the ways of God.

I don't like to be away from home. This is awful hard work. By the way, I am not doing any of it this winter. I expect you will wonder why I do it. I went out just for a little while in Ohio; I got heartily sick of it. I struck a little town, and the chairman, when it came time to open the meeting, no one was there, asked me what to do. I told him to open the meeting He says, "The Audience will come forward and we will open the meeting with a song." Well, after a while we got along pretty well. When the second day came I was awful tired. It seemed to me a farce. I hadn't met the people very much; I had told them how to grow clover in clay soil and after a while make it rich; how to plow the land up, and so on. The second night. some of the ladies came to me and said: "Mr Wing, why don't you come to our oyster supper; you can come over there and eat to the glory of God." I went over there and they sat me down to a special table. Finally after some conversation, I made the remark, "I wish you women would tell me why you come to the institute." They looked surprised- "don't you want us to come?" I love to talk to ladies. But I said, "What is it to you to listen to talks about cows, and steers and hogs?" They were silent for a little while; then a little black-eyed woman said: "Maybe I can tell you; my husband and I lived in the city until a few years ago, and his health broke down;we came to the country and bought a little farm; we are very much in debt; but we sat and listened to every word that was said in this meeting; now we are going home; we are just beginning to get hold, we just feel so much confidence that we are going to get on."

The President after calling the attention of the meeting to the joint session of the Park and Forestry Association, Horticultural Society and the State Farmers' Institute in the rooms of the Horticultural Society at 8 o'clock P. M., declared the meeting adjourned until 9:30 o'clock A.M. Wednesday, December 13.

PROCEEDINGS

Of 1905

STATE AGRICULTURAL CONVENTION

and

CONCLUSION OF STATE FARMERS' INSTITUTE MEETING.

Wednesday morning, December 13.

The State Agricultural Convention convened in the rooms of the Degartment of Agriculture ot 9:30 o'clock A. M., with its president, W. W. Morrow, in the chair.

Meeting called to order and on motion the President was directed to appoint a committee of three on credentials and a committee of three on resolutions.

The President appointed as said committees the following named delegates:

COMMITTEE ON CREDENTIALS: O. A. Olson, Winnebago county; C. W. Hoffman, Decatur county; Fred McCulloch, Iowa county.

COMMITTEE ON RESOLUTIONS: H. P. Hancock, Fayette county; J. F. Morris, Sioux county; R. W. Cassady, Monona county.

THE PRESIDENT: The first on our program this morning will be, "Benefits derived from the Show ring; by Exhibitors; by Visitors"; by Prof. C. F. Curtiss.

BENEFITS DERIVED FROM THE SHOW RING; BY EXHIBITORS; BY VISITORS.

C. F. CURTISS, AMES, IA.

Mr. Chairman and Gentlemen of the Convention: The subject assigned me as stated by your president, is one that naturally is of a good deal of concern to people who are connected with fair management, and people who are connected with the agricultural and the industrial interests of the state. I need not say that I believe in fairs and in the educational influence of fairs, and I believe in educational work and that there is no lesson stronger than an object lesson. That has been clearly demonstrated, there is no way by which a lesson can be presented to young men or old in such a forcible, such a lasting and such an impressive way as by the object method. And that is the method of the fair. The fair presents its lessons, its truths, by the object method in such a way that they appeal to the mind and to the judgment. Consequently the principle upon which the educational work of the fair is based is a sound one, and so recognized by the best educators.

Now the fair reaches a large number of people that probably could not be reached by any other educational method. Fairs have come to be regarded as the great educators along agricultural lines, and I wish to say in that connection that I do not think there is any fair that reaches as many people from the farms or the agricultural community as this fair, I believe that is generally conceded. There are other fairs that have larger gate receipts on the ground of advantages which they possess, but I do not think there is a single fair on this continent that reaches as many people from the farm as the Iowa State Fair. I believe that it is a fair which appeals more strongly to the people and draws more largely from the classes of people that it is intended to benefit, than any other fair we have.

The benefits to the visitors are in the way of object lessons and in the way of establishing standards, and of giving judgment by comparison. Now one of the first things essential to success, in the creation of products of any kind, is the right kind of a standard. That is particularly true in agricultural products. It is true with reference to live stock, with reference to grain and with reference to fruit. It is true in all educational work. The man must first have a right conception of the object to be attained and the standard to be attained, or he will not succeed. The fair is of advantage in bringing together the best representatives of models, in establishing standards of excellence, and the best products are brought together for competition, and in this competition the best standards are given preference, so that there is a standard of excellence established in competition at the fair that is a starting point, a basis, and a fundamental essential fact for improvement. If a man's standards are wrong, if his conceptions of what constitute a high type of product of any kind are wrong, certainly he is not going to attain a high degree of excellence. The fair then is of great advantage to the visitors in that respect.

Now the fairs have been improved largely in making the educational feature more prominent. The stock pavilion over here, and the new horticultural and agricultural building, have been a great benefit in that line, they have enabled visitors to see exhibits under much more favorable circumstances. The bringing of live stock exhibits in one large Coliseum building, with comfortable seating capacity, wit hcatalogues giving information and with catalogue numbers displayed on the attendants, enables people to get the information they want about the exhibits before them, and to see the animals brought before them for comparison. It is very essential I think that we make the most out of these educational features of the fair. This principle of comparison, of establishing standards, is one upon which sucessful work of all kind must be based.

It is related, and accurately I believe, that in the early days of the life of John Ruskin, the great artist, his father, whose business required him to travel extensively, took the boy with him on trips to foreign countries, and he often visited great art gallaries, and in order that the boy might have nothing but the highest ideals put before him the father often preceded him into rooms of the gallaries and took pains that he see only pictures and works of art of the highest standard. That is the way with the boy who is brought to the state fair ground where the highest products of live stock, grain, implements and all other devices calculated to advance the agricultural interests are brought together. It is the place where the highest types and standards are displayed, so that the educational influence being extended in this way by the object lesson method is very large indeed, it is one which cannot be calculated in its influence for good in reaching young men and old men. It presents the latest method, the latest improvements in agricultural work.

Then the benefits to the exhibitors are numerous. It is generally conceded that there are no better means of advertising than the bringing of products upon the state fair ground in competition with those who are engaged in similar work, and before those who are interested in these products. In many instances the exhibitor does not find exhibiting profitable so far as the actual returns are concerned in the way of premiums. In many instances the premiums will hardly compensate for the expense incurred. There is a great expense in preparing products, particularly live stock) for the fairs. A man needs to begin a year in advance, as soon as one fair is over almost he needs to begin preparation for the next fair, and there is a large outlay in preparing these products. Then the returns in the way of premiums will not compensate for this, but the returns that come to a man in the way of establishing a reputation, and establishing the merits of his stock are very much greater than any returns which come through other lines. The man who establishes a reputation for his products attains a name as a producer of high class products, has in a measure added to his working capital, and that is in many cases a very large advantage. If a man establishes that reputation, and then suports it and backs it up by a reputation of absolute honesty and square dealing, he has an essential basis for successful work in the prodution of his product, whatever those may be, whether they be agricultural products, implements or machinery. Those things are essential to sucess, and in this connection it is proper to say that I believe it is the general and almost universal verdict that there is no fair equal to the Iowa State Fair, as a place for advertising and selling goods. Men who make it a business to follow the fair circuits throughout the season, going on rounds of the varicus state and district fairs, tell me that there is no place that compares with the Iowa State Fair ground as a place for extending their business; that there are more customers that attend the Iowa State Fair than any other fair they attend, and I believe that is in line and conforms with the statement that the fair here is attended more largely by people who are actually engaged in farming and that sort of work, than any other fair we have. They are the customers these men desire to reach, and that is one of the features of the Iowa State Fair. It is a fair which attracts the people in the largest numbers and which attracts exhibitors in the largest numbers because of the fact that they reach a constituency that is worth more to them than the constituency of any other fair. So that these two principals operate together.

There are a great many other benefits and lessons to be derived from the fair. The fair is a good place to reveal, as well as to develop character. In many instances, it is worth a good deal to the exhibitor to get into competition with his rival: it is worth a good deal to know how his product compares with the other man's product; it is worth a good deal in the way of discipline. There are some men who are good winners and poor losers. Those men as a rule make poor exhibitors. The man who is cool and complacent to take defeat successfully, and take it without complaint, is the man who gets there. He may not always get just decisions, sometimes there are conditions which make it difficult for a judge to determine just what is the proper rating of the products before him. But I believe it is generally conceded that the judgments rendered by the various awarding committees at the fair is greatly improved, and that in the main the awarding is done intelligently and honestly. There will of course be instances where the judgment of even the most competent men will differ, where the judgment of the exhibitor will differ from that of the man who is placing the award. That cannot be avoided. But the man who is broad and liberal in his views, who is willing to extend the broad liberal spirit to the judgment of other men, is the man who gets the best as a fair exhibitor. There are places where the circumstances are trying of course, but this is an important feature of the work. Men who go out as exhibitors, or who go to a single fair as an exhibitor, have a good deal to learn, and the public has a good deal to learn, and the man who passes upon these awards has a good deal to learn. It is all a great educational work. And the benefits to be derived from it, in the way of education of the public, and especially of the younger men who are growing up in this work, are beyond computation. They extend out into the state in every community. You can hardly go into any community in the state where you cannot trace some direct improvement as the result of ideas or suggestions that have been gathered at state fairs and at county and district fairs.

The British Islands have the reputation the world over for producing more high class live stock than any other place in the world; in fact most all the best classes have produced there and they have been distributed over the globe. Those people have made a careful technical study of the improvement in these lines. It has been said that Great Britain is a land of fairs and shows, starting early in the season, from May to December there is a continuous round of local and district fairs and shows. I think there is no question but that a large part of the result obtained in that line is due to these shows that they maintain. The men go there with splendid spirit, they go there with their products, and put forth the most intelligent efforts they can possibly bestow in order to win, but if they do not win they are willing to concede the rights of others, and they go home determined to improve and they come back stronger next time. And those fairs distributed as they are throughout the land from one seasons end to another almost, have been a great educational factor. So it is in our own state. County fairs are destined to play a much more important part in our agricultural conditions each year. And as we improve our State Fair standard, we are also helping to improve the county and local fairs.

THE PRESIDENT; The next on the program will be an address on "How can our foreign markets for beef and pork be increased by Hon. W. A. Harris of Chicago.

HOW CAN OUR FOREIGN MARKETS FOR BEEF AND PORK BE IN·CREASED .

W. A. HARRIS, CHICAGO, ILL.

Mr. Chairman and Gentlemen: When I received the very kind invitation of your Chairman to address you on this subject, I hestitated. There are a great many questions that have to be touched upon in such a discussion that made me pause somewhat, and consider whether or not I could present them to you in a way that would not excite an improper attitude. I desire to occupy the position myself of looking at this matter as a great business question, which confronts the livestock interests of the United States. I believe most earnestly, that we are face to face with a stituation such as we have never dreamed of in this country. I did not desire therefore to run counter to anything in the nature of prejudice, of party feeling, because a proper discussion of this question involves a discussion of great national policy. It involves a discussion of subjects which to some men have become a sort of fetich, a superstition, to which they bow down and venerate regardless of its logical and true effect. But I thought that this great State of Iowa had people who are composed of a different timber, that I would meet here men from the farms, from the feed lots, who are vitally interested in the discussion of this great question. And as I represented the American Live Stock Association, and the Shorthorn Breeders Association, it was my duty to come here representing those organizations, which cover the great field of live stock all over this country and tell you what I believe to be the absolute, actual facts.

At the time I received the invitation it so happened that I had been reading an account of the conquest of the wonderful region which lies between the Alleghany Mountains and the Mississippi River, the period between, 1785 and 1800 was one I thought which covered the most romatic period of the history of this Nation. First the Colonists and the English together had fought the French and the Indians, for the possession of this great region; then the French and the Colonists together fought the English and the Indian combined for the occupancy of this great region, and at last, as we know, it became a part of the great new Confederacy that had sprung into life along the Atlantic Coast. Their domination extended as far as the Mississippi River, first France and then Spain covered with their colors the region which you now occupy, clear down on the west bank to the mouth of the Mississippi river, and a part of it on the east side. The strong, vigorous men who had gone through with this terrific conflict, and had finally settled the Valley of the Ohio, in the regions of Kentucky, Tennessee, Southern Ohio and Indiana, thought they had found a new Eden. It was a wonderful contrast to the country they had left east of the mountains and they went to work vigorously, and began to develop the agricultural resources, corn, tobacco, hogs and everything of that kind were produced, but all at once their efforts seemed to be paralyzed. Spain dominating the mouth of the Mississipi river, denied them the free navigation of the Mississippi. They could not find a market for their products. Spain imposed an excise tax of 50 to 75 per cent ad valorem, for everything passing out of the Mississippi river, and they found their products practically destroyed, and at the same time the value of the land which had cost so much blood was being absolutely wiped out. There was tremendous indignation. They blamed the National Government for not protecting their interests, and they actually talked about organizing a new and separate government, but finally with the wisdom and far-seeing sagacity of Mr. Jefferson, with the enterprise and energy of Mr. Monroe, who was seconding the effects and aim of Mr. Robert Livingstone, all combining with the necessities of the First Counsel, then controlling the destiny of France, we succeeded in acquiring the great country known as the Louisiana Purchase, and with it the free and unmolested navigation of the Mississippi river. That was the first road to the market of this great country you occupy, and it was the first great question, which perplexed the people occupying—not this region, because nothing but the Indians were here—but this great central valley of ours in its great progress towards Empire, they were first met by the great problem of the market and how to reach the market and how to avoid unjust taxation.

This question therefore that you bring up to-day is over a hundred years old, as applied to this country. I can remember the first time I came west on a visit as a boy, seeing little packing houses along the Mississippi river, hogs were driven from the interior and delivered to those packing houses at two cents and less a pound. The Mississippi river was the only outlet, and it failed to answer the purpose. Then came the great era of railroad construction and afterwards of railroad consolidation, until finally we have great single corporations controlling the roads from the extreme west to the extreme east. That has bettered the condition, that has helped, that has enabled you to go on and prosper, and still there is something lacking. The question of transporation is one which we have had to fight all through the west. It is I believe about to reach a satisfactory solution. We cannot deny that we are dependent upon these great railroad corporations for everything that is involved in civilization. Our very existence has been rendered possible by the railroads of this country. No man in all of this broad country has a higher admiration for railroads as a great civilizing agency than I have I believe that the locomotive engine, as an example of constructive genius and ability comes nearer placing man at the feet of God than almost any other thing of which we have knowledge. But they are the highways of the public, they are not the private property of any corporation, and therefore I think there has been a universal decision that their taxes, which they levy for transporation, must be controlled in the fair and just interests of all of the people. And I think that question will probably be permanently settled by the present Congress, which is now in session.

The question which follows transporation of course is one of free, open and competitive markets. There has been an immense amount of discussion, an immense amount of angry crimination and re-crimination on that subject. How far our domestic markets have been controlled unfairly and improperly, whether or not every man has received the fair and open competition which he is entitled to, in the market; there are all questions that the public mind has been agitated about for a number of years. That question too, if there has been any just cause of complaint, I believe also we are just about to have fairly settled.

But there is a still greater question above all of these and back of al of these, and that is, after our great domestic consumption has been supplied, where shall we place the enormous surplus which we are producing in this country. This surplus is the thing that has troubled the agricultural interests of the country from time immemorial because the price obtained for the surplus determines practically the price obtained in the domestic market, for the great mass of the production. Some fifteen years ago or so, in the hard times, which we had in Kansas, and which to some extent I think you had in Iowa, they were troubled with enormous corn crops which they could not dispose of, and compared with the price of coal, corn was cheaper as fuel than was coal, and it was being burned all through the western and middle part of the state. It seemed an abnormal condition of things, and Governor Charles Robinson, who was one of the ablest men Kansas ever had, was very much excited, and he went around the country delivering addresses on the question of what shall we do with our corn. About the same time a very distinguished and brilliant woman was very much distressed, over the condition of the better half of humanity, and the young girls in particular, and she was addressing the people of Kansas on the question of "What shall we do with our daughters?" Some way finally suggested that both of these great problems might be solved, and gave the answer. "Let us feed our corn to our daughters." That seemed a sure way of solving the problems, but it also had a great deal of the ludicrous about it.

Now there is a school of economic philosophers in this country who occupy practically the same condition and say that we must so balance manufacturers and agricultural productions, as that the agriculturalist will use up all which the manufacturers produce, and the manufacturer eat all the farmers produce, and so we will get rich trading with each other. But I do not think that can stand the test. We must have an outside market, not only for the agricultural products of this country, but for the great manufacturing interests of this country. I believe that the destiny of this Nation is to take the lead, the fact of the matter is, it has already taken the lead, so far as feeding the rest of the world is concerned, and it will soon take the lead in the manufacturing interests of the world. But we cannot do it by simply swapping jack knives with each other. We have got to go outside. Let us look just for a moment at the comparative conditions of the livestock interests here and abroad. Monday morning I happened to pick up the "Livestock World", one of our reliale Livestock papers for last Saturday. Here was the first heading which struck my eye.

CATTLE RECEIPTS EXCESSIVE.

Big Flood of steers caused a decline of 25 to 40c in medium cattle.

Close to 93,000 cattle arrived this week. The record total receipts was not broken by about 2500 head, but there never was a week in the history of the cattle market when the supply of native beef steers was so liberal. Offerings every day in the week were exceptionally large, showing that the movement to market was no spasmodic accident. Both on Monday and Wednesday receipts exceeded 33,000 head, a circumstance that never occurred before, for during the time when the big weeks were recorded in the past, one or the other of these days were comparatively light. Local dealers are at a loss to account for this sudden bulge in receipts There was no logical reason for it except that the cattle were in the country and that feeders were tired of shoveling into them high priced corn.

As I passed out of the yards I looked up at the blackboard and there I saw that the receipts for Monday, day before yesterday, were 38,000 head, showing that this week again we are likely to have the same kind of a flood of cattle. As a matter of course the price must drop. I talked with some of the leading packing men there, I asked them what they were going to do, and they said "We do not know where on earth to put these cattle, If we buy them we do not know what to do with them." The normal demand, as we all know, upon Chicago, for all kinds of meat, for the export trade that we have to-day, for distribution all over, through the refrigerator plants of the great packing houses, is about 60,000 head; that they can dispose of without making any particular break in prices. But when it runs up 50 per cent more than that, they are at a loss, what to do, as much as we are. Now then that is the condition here. That has been the condition so far as the cattle men are concerned for several years. As I listened to the very interesting talk delivered by our friend Joe Wing on the question of lamb feeding yesterday, I thought what happy fellows you sheep men are and have been for the last few years. The country has been educated by abandoning the old wrinkled Merino ram, and come to mutton sheep. There is no trouble about the price of mutton, because the supply fails to keep pace with the demand. But with beef and hogs it is the other way.

How is it on the other side? The Nations which have big populations, and which have habits similar to ours to-day are enjoying prosperity as we are. We do not need to think that in the last seven or eight years, when we have had such gratifying conditions, that we are the only people in the world. Prosperity, as compared with the previous decade, has existed all over the world. The English, the Germans, the French and the Italians, have all felt the upward lift which has been brought about. But what? By any particular tariff schedule, by any particular local legislation? Not at all. The world has had a period of war going on ever since 1898, there have been great wars, either between us and Spain, between the English and the Boers, or later the Titanic struggle, between the Japanese and Russians. There has been an abnormal demand of everything nations could produce. At the same time there has been coming from the mines a flood of gold. It is a repetition of the period of 1857 when Michael Chevalier wrote his book on the flood of gold, which was saturating the world at that time. So with the unnatural demand as the result of war, with the stimulus which comes from the increase in the money of the world, we have had a tremendous advantage, but we are now face to face with peace conditions, and that is the reason why we have got to consider seriously. Let me give you a statement of the livestock condition of Europe. This was prepared about a year ago by the ablest statistician on this subject I think that there is in the country.

"Great Britain flocks and herds have, if anything, gone back while the population has gone ahead. The flocks and herds of Ireland have virtually been stationary for a quarter of a century. Twenty-five years ago France had 188 head of livestock per 1000 acres of her area. She now has 164 head, or a dead loss of 24 head per 1000 acres of the country.

Denmark had 197 head per 1000 acres then, and 115 head now, or a loss of 82 head per 1000 acres. Germany, a quarter of a century ago, had three time as many sheep per head of population as now. The Fatherland now has fewer cattle per capita of the people than then. Holland and Switzerland have only half as many sheep per head of population now, as they had two and a half decades ago, and Belgium only a fourth as many. In these countries during that time the flocks of sheep alone have actually decreased from 104 million to 75 million, showing an actual loss of 28 per cent. At the same time the increase in the population was 25 per cent, thus making the comparative loss much greater. The combined population of Germany, France, Austria-Hungary, Switzerland, Sweden, Denmark, Belgium and Holland, twenty-five years ago was 140 million. This human family has now increased to 173 million people or 24 per cent. Meantime the combined herds of cattle of these countries have only increased from 48 million to 58 million head, or about 20 per cent."

"The relative scarcity of meat upon the continent is readily seen by the excessively high prices paid there for all carcass meats. These prices average 100 per cent higher wholesale than similar meat sell for in the United States, and 30 to 50 per cent higher than they do in England, even in the face of the facts that labor and other continental items of production are cheaper than either in Great Britain or United States. The growing scarcity of the worlds edible meats is produced by the two causes previously named; the faster increase of the human race in porportion to the increase of Abattoir animals, and the improved condition of the working classes, which causes a greater per capita consumption of meats than existed two decades ago. The per capita consumption of meats in the United States has increased fully 25 per cent during the last 15 years. In Great Britain it has nearly doubled, in the same time. On the continent the demand as measured by the very high local prices of meats has largely increased, but the increased consumption has been limited by the virtual exclusion of foreign meats, and the insufficiency of domestic herds to supply the local demands. With improved industrial conditions and continuing high meat tariffs or other means for excluding the surplus of other countries the masses of the continental nations, must desist from meat eating or pay exorbitant prices for this essential staff of life."

That was written a year ago. Let me see now what is the actual condition to-day justifying absolutely the statements made in the article just read. This is a review of the situation in Germany as it exists now, and was brought about by a meeting, which occurred not long ago when an appeal was made by the consuming class in Germany for the opening of the country to foreign meat supplies.

"The feature of the meeting which will perhaps justify this brief review of its proceedings is the definite and authoritative exhibit which was made of the degree to which the market value of meat producing animals has been increased in Germany by the influence of the meat inspection law. Beginning with the statement that in other European countries the price of meats and domestic animals, are not now unusually high, the memorial goes on to declare that according to the reports of the Imperial Bureau of Statistics—certainly a conservative and unbiased authority—during the winter months of 1900, the average wholesale price of live hogs was $21.42 per 220 pounds, whereas they are now scarce and difficult to obtain at $30.94, or more than 14 cents per pound avoirdupois. Fat oxen, which cost on an average, in the period from January to March 1900, $24 per 220 pounds, are now scarce and of inferior quality at an everage cost of $32.75, or about 15 cents live weight per pound avoirdupois. Fat cattle of superior quality are still higher. Calves have likewise risen in price from $31.65 to $39.03 per 220 pounds, and lambs from $25.70 to $32.50 per centner. The memorial will be laid before the Ministry of the Interior and, if satisfactory action is not taken in the form of a ministerial decree, the subject will be brought before the Bichstag at its coming session, with a view of repealing or radically modifying that portion of the present meat inspection law, which regulates and restricts the importation of meat producing animals."

There is the situation. On this side an enormous surplus, an enormous increase in quantity, and an improvement in quality, because we are producing better now than we ever did before. On the other side, taking Germany as an extreme illustration, but the same conditions practically apply to France, Italy, Spain, and Austria-Hungary to a certain extent, how are we to bring these two great problems together? There a deficiency and here a surplus.

Commence is an exchange of commodities, and it is an admitted fact that no country has prospered without commerce. We must have commerce with all the world, the world is growing smaller every day, we have to re-adjust our relations with other nations just as we do when one locality becomes crowded each neighbor has to re-adjust his situation so as not to infringe on the rights of each other neighbor. As we get crowded we must change our relations. As we get farther advanced in civilization, arts and sciences, those things which may have been necessary in the infancy of the arts and sciences, cease to be necessary. New conditions, radical changes, frequently are absolutely necessary in order for their continuance and their prosperity. We have a theory in this country, and I most thoroughly and earnestly believed in it, because as a boy, I got my politicial impressions largely from reading the speeches of Henry Clay, the great Father of what is called the American system of protection, and I remember well the impression which was made upon my boyish mind the eloquent appeals that he made to the patriotism of his fellow citizens, to endure this burden for a little while. He said it was absolutely necessary that the great mass of the consumers should be willing to carry a burden of higher prices, in order that our manufacturing interests might become independent of foreign domination, that they might get upon their feet. That has been the key note. And in addition to that there has been the principle underlying protection, which is that we must be willing, as a matter of self interest to see a higher scale of wages maintained, among the operatives of the manufacturing interest of this country. It was better for all of us that we should carry that load collectively, and better that that condition should prevail. Now that is a proposition that I think the whole American people are to-day willing to accept, Democrats, Republicans and all.

It is a great mis-use of words to use the word "Free trade" as applied to any political party in this country. There is no such party. No party has ever advocated it. The Democratic party practically whenever it has had an opportunity has recognized the necessity for discrimination in laying taxes for the purpose of protection. The Republican party of course has been committed, as a cardinal principle of its existence to the maintenance of the differential between the cost of this product in this country and abroad. Now let us consider this proposition. We are all protectionists; then what? Shall we continue the same conditions which existed in the past, when these infants were first occupying the attention of the public and the sympathy of the public? Shall the billion dollar steel trust of to-day, which dominates the iron interests of the world have the same consideration at the hands of the public that it had when it consisted of a few scattered forges and foundries all over the country? Isn't there a necessity for a different consideration? And the same way with other things. But I am not in favor of hurting anybody. I am in favor of doing what Mr. Roosevelt says. I am in favor of making some of these corporations take their feet out of the trough. Now let us see. The trouble between us and Germany—I mention Germany particularly, because that is the acute point just now—Baron Von Sternburg came the other day with instructions from Minister Von Beulow, to endeavor to arrive at satisfactory arrangements, with the United States Government by which they could get our meats, bread stuff, etc., and by which we would be willing to take something more from them. The trouble with Germany is a very simple one, we have been selling her something over 200 million dollars worth of goods and have been buying from her only about 100 million dollars worth of goods. Can any nation go on indefinitely paying 100 millions in good balance all the time? It cannot be done. There is not gold enough in the world to enable those great countries to continually pay us that balance of trade. Mr. McKinley said at Buffalo that it was impossible. And even if it was possible, such a condition would be good neither for us, nor for them. Commerce is an exchange of commodity. Let us see what would be the condition of Germany so far as these interests we are considering to-day, if we had some kind of reciprocal relations, some kind of an arrangement by which we could do business with them, buy things of them, and they could buy things of us to mutual advantage. That is the kind of trade which appeals to nations.

Germany imported last year 305,346 head of cattle altogether from Austria, Demark and Switzerland—a slight falling off as compared with the two previous years. Owing to the recent crop failure fodder values were so extremely high that farmers and feeders were obliged to rush their cattle to market to such an extent that to-day there are practically no native German beef cattle in the country. Our export of live cattle to Great Britian for last year amounted to 387,467 head; and while we may not perhaps hope to attain these figures with respect to shipments to Germany, in the event of treaty arrangements being effected, nor would we expect to supply similar quality, yet that market would easily take from 2500 to 3500 head per week, and of the quality so desirable for the American farmer and feeder to find a market for; that is to say, range cattle. Experience of those conversant with German requirements vouches for the fulfillment of this prophecy. The opening of a market like this is the only solution of the price problem. (The reason for the demand for comparatively inferior cattle in Germany is explained by the fact that the wage earner is not paid upon so high a scale as in Great Britain, and is obliged to buy quality according to his means.) And just at that point let me say that I had a conversation with one of the greatest exporters of cattle, and he said if the proper arrangement had been made with France, if the treaty of reciprocity with France which was negotiated by Mr. Kasson, had been ratified, that he would have shipped a thousand head a week of bulls to France, he would have made a speciality of that particular kind of meat, because he said the French market demands strong coarse boiling meat—they do not broil, they do not roast, but they boil and stew meats from one end of that Republic to the other; and he would have confined his exportations to bulls and stags, the coarsest meat in our market. So with each nation, each has its special requirements and habits in the way of meat.

Were it not for the fact that during the past five years an unusual condition prevailed throughout the world (i. e. the Boer was from 1899-1902, the Boxer trouble in China, 1900, and the Russo-Japanese War, 1902 to 1905), the great bulk of the kind of cattle referred to above could not have under any circumstances found a market in the States at any of the packing points except at ruinous prices. These disturbances made an unusual demand for canned and pickled beef, used as army supplies; and thus it was that these light-cattle went into consumption in tins and barrels. Figures from the statistical abstract—I have got them here at the end in a table, but it is not necessary to weary you with reading those—will bear out the truth of this statement.

Never was the time so opportune for effecting a commercial treaty with our German friends as the present. The situation in the Empire is most critical, the country being involved in a meat famine, the porportions of which have astounded the whole world; records show us that in one year 1200 horses were slaughtered alone in Berlin for food, and 79,000 were consumed, all told, in Prussia, for the same year. These horses were not young animals, but old harness ridden beasts, in practically all cases discarded tramway horses.

Misfortune makes us wondrous kind, and Germany in her distress proffers a most kindly hand, which we must not fail to grasp at this time, for out of her misfortune great benefits will come to us if we heed her. She is a mighty power, and naturally proud, and unless we treat with her in an equitable spirit she would prefer to suffer rather than be humiliated, so it behooves the United States Government to act fairly, and that just now. This is a matter of vital importance to the agricultural interests in every part of the United States, for without this and the other continental European markets, which invariably look to Germany as a leader in affairs of this kind and imitate her policies, the time will not be far off, when the cattle interests in this country will experience a situation never heretofore thought possible.

As the table of exports of this class of products shows, Germany since 1900, has taken practically none of our canned meats. The imports that year represents the product suitable for canning, from over 100,000 range cattle—(equivalent to about 2000 head per week); and to what extent this canned meat trade could be developed in the German market, if the embargo could be raised, and which will be raised, if the proper co-operation of all the agricultural and allied interests can be made a certainty, and the tremendous influence which such interests can wield, could be brought to bear upon Congress to insist upon its acting as it should in this matter, would astound those unaccustomed to the possibilities of such trade. We should easily triple the business. This is not idle conjecture, but the concensus of opinions of practical business men conversant with the situation in all its details. One can plainly understand what such an increase means; just so many more cattle demanded by the canning factories, and naturally an increased demand means increased values.

It will be noticed that the table, while it shows a decided improvement in canned meats, during the past six years, as compared with the years 1898 and 1899, notwithstanding the fact that Germany imported but a nominal quantity during the last five years, that these increases occurred only with the countries which were directly involved in war, or which were interested in furnishing supplies to them, and therefore is not a natural increase incident to trade. This is pointed out in order that the casual investigator, who looks over the statistics, and finds a continued increase in exports during the last six years, is not misled in drawing his conclusions as to Germany's importance as a market for our canned meats.

We simply must have this market. And woe betide the range cattle interests of this country, if we fail to secure it.

As the table shows, Germany is a heavy buyer at the moment of our barreled beef. She takes the product suitable for the purpose or about 50,000 head of cattle annually in casks, and of the kind described as "range cattle." Now unless satisfactory conclusions are reached with her before March 1st, 1906, barreled beef as well as all other packing house products will be practically prohibited from entering the country, owing to the highly increased tariff rates to be inaugurated at that time.

We must also consider Germany's imports of our pork products. There has been since 1898 a decided falling off, as the following figures will show: Their import of fresh pork in 1898 was 3,067,100 pounds; in 1904 it amounted to 149,160 pounds. Hams and shoulders, in 1898 was 9,555,700 pounds; in 1904 it amounted to 186,120 pounds. Bacon in 1898 was 57,423,070 pounds; in 1904 it amounted to 4,119,940 pounds. The total imports of all meats fell from 103,934,700 pounds in 1898 to 9,552,400 pounds in 1904.

That shows the extent to which our markets are being cut off. To Italy we furnish practically nothing. France tried to get into proper relations with us, she entered into a reciprocity treaty under Mr. McKinleys auspices, which I have alluded to, negotiated by Mr. Kasson, by which she reduced duties upon our imports, into her country by 15 to 40 per cent, and we reduced the duty upon limited articles from her country on an average of about 7 per cent, from 5 to in one or two cases twenty per cent. And yet for some reason or other the Senate absolutely refused to ratify it. Special interests came to Washington, I remember it distinctly, because I made every effort possible for me to make in order to secure the ratification of these treaties. The treaty with France would have been worth 40 millions a year to the agricultural interests of this country, and it would have been the beginning of a great trade. But special interests came in, the knit goods interests of Rhode Island, although they are enjoying a duty of about 65 per cent said they could not stand a reduction of ten per cent. The brass jewelry manufacturers of Connecticut protesting. The cloth manufacturing insisted they could not live with a reduction of about ten per cent on their products, although there is a high protection for them. And so it brought about the rejection of this great treaty, good for the agricultural interests, and which would have been the beginning of better things.

What is the duty, what is the attitude of the livestock and agricultural interests; because our grain, wheat and flour are as much affected, they are to be excluded. As a matter of course we are more concerned in the finished product; we want to feed our grain to our steers and hogs and ship the finished product; we want to grind our wheat into flour and ship nothing but flour. Those ought to be the things this country ought to foster and encourage. What is to be the attitude of you gentlemen, what are you going to do about it? A great party now in politics in this country has pledged itself over and over in favor of reciprocal arrangements with foreign governments. The last expression of the will of the people is to-day to be found in section 3 and 4 in the Dingley Bill.

Section 3, provides for reciprocal arrangements on a few limited articles, and secretary Root is trying to-day to do the best he can with Germany under that section, but it confines him to a small number of articles of limited use. The German Government insists that there must be more articles added to that list. Section 4 covers all the articles mentioned in the tariff schedules and it provides that when reciprocal concessions could be obtained the President of the United States was authorized to make treaties with foreign governments to reduce the duties described in the Dingley act by not to exceed 20 per cent. The misfortune was that those treaties were not to be put in force by the President alone but they must be submitted for ratification to the Senate, and there is where the interests of the country have been crucified. One trouble was that the provision of section 4 of the Dingley bill was that these treaties must be negotiated within two years from the passage of the act; and a large number of them were, some 12 or 14 treaties were negotiated within the two years. But that time has expired, those treaties fell to the ground by senatorial inactivity. That section is now inoperative by force of the time limit, we have no power to act now under that section. And yet here we are face to face with an exclusion by the great continental countries because we do not play a fair game, they say.

Now one idea that has been in the minds of a great many of our public men for a great many years is this, that they have got to buy their bread and meat of us, and you cannot starve a nation, they will buy of us anyhow. That is no longer true. The world has moved on. To-day the Argentine confederation is the strongest and most dangerous competitor that we have found for the trade with Great Britain, and they are crowding us closely. It is the greatest natural cattle country that the world ever saw. It so happened that I spent four years down there as a boy, and I never will forget the impression which those magnificent pampas made upon my mind. It is the State of Illinois multiplied by 100, when you come to consider it. In the northern part of the country you can grow figs and oranges easily in the open air, and it extends in an unbroken plain to the south for 2500 miles, and it is all rich prairie land practically. They are spending more money, and have been in the last ten years, then any other people on earth in order to improve their stocks of cattle. They are lavishing fortunes upon the best bulls and cattle that Great Britain can produce, and they are able to raise cattle that would astonish the American citizen. They also have enormous sheep interests. They have learned how to ship dressed beef. For a while we rested secure in the idea that they had to pass through the tropics to reach the continental market, and that they could not ship dressed beef in the chilled condition that was required; and that was a great difficulty for awhile. But they came to Chicago and took down the best experts they could get in that line of business, and they have built up packing houses there that now send in dressed beef and mutton to Liverpool and London and they are cutting our throats in the English market, to say nothing of the Continental markets. The Continental market prefers to deal with Argentine. Why? Because Argentine buys things of them, and the balance of trade is kept in a fair and even condition. Great Britain of course imposes no duty upon anything, that is upon any food product at least; she considers that the policy of open doors is better for her interests. And we all meet on the same plane in Great Britain, but neverthless there is a natural tendency to trade with those who trade with us upon the fairest terms, and Great Britain would rather see the Argentine meat take possession of her markets than to see the American meat take possession of them because Argentine puts up no barrier of exclusion against English manufacturers. That is natural.

Now people who examine the statistical abstract and the various reports of the government say our imports are increasing every year, and we cannot help but be prosperous. We exported 1,500,000,000 in round numbers we exported an enormous quantity of manufactured product.

That is all true, but as I say there has been a reason for it. We have lost trade with continental Europe, our exports to Europe have diminished our exports to South America are practically at a stand still; and but for the enormous increase of exports to the Orient we would have been way behind, and those exports are caused by conditions that are temporary in their character.

I beg you indulgence while I give a little statement of the condition of our export trade generally. Those who have assumed to drag the whole country by the heels into a possible trade war with Europe, and who,—ignoring the reciprocity preventive in the Dingley law, will probably point to our increase of exports for the fiscal year 1905 over 1904 as proof that our foreign trade is all right, that there are no screws loose, and that there is not a cloud on the commercial horizon portending any trouble. They will point to a total export gain of $57,700,000 for the past fiscal year, and they will assume and claim that that proves their case. Let us take all of the facts. Our gain in Asiatic trade—largely because of the Russian war—was $67,500,000 or nearly 10,000,000 more than our increase with the world. The trouble is that we lost in our trade to Europe 36,415,000 dollars. Our loss with Africa was 5,700,000 dollars. We had a gain in North America of $25,700,000 and in South America of $6,450,000. But for Asia we would have had to put up with a ten million dollar loss of trade with the world, and we should not overlook the fact that our increase with Asia is abnormal, and not to be relied upon after the war, and especially not, after Japan and China get to work to capture and control "The trade of the Orient."

It is all well enough to keep our commercial eye glued to the Orient, but it is more important that we do not overlook Europe. There we find our reliable consumers and the money that keeps our surplus in motion, which in turn prevents stagnation and low prices.

That there is trouble somewhere with our foreign trade is indicated by other statistics issued by the department of commerce for the year ending June 30, 1905. Taking some of its figures we find that while the total increase of domestic exports ($56,415,000) standing alone, will be accepted by some and claimed by others as entirely satisfactory, especially when used in connection with a gain of 91,000,000 dollars in exports of manufactures, the bare publication of these figures fails to tell the whole story. They will probably be used freely however to show that there is nothing in our trade relations calling for reciprocity or trade agreements but as has been intimated that is a very misleading inference drawn from only a part of the whole case. The fact is that of the $56,415,000, gain in total exports, $54,000,000 was in three items only, as follows:

Iron and steel	$22,700.000
Cotton Manufactures	27,300,000
Leather,	4,000,000

On those three great highly protected interests we have gained, but on the other hand, what fate met some of our other manufactures

Our agricultural implement exports fell off	$2,000,000

Onr car, carriage and vehicle exports fell off	325,000
Our scientific instruments exports fell off,	125,000
Our marble and stone exports fell off,	310,000
Our musical instruments exports fell off,	80,000
Our parafine and wax exports fell off,	1,000,000
Our lumber manufactures exports fell off,	4,300,000
A loss in manufactured exports of	$8,950,000
Our exports of agricultural products fell off	32,570,000
Showing a loss of	$41,520,000
Allowing for some slight gains, the net loss of agriculture, and certain lines of manufacture was about	$40,000,000

We submit that a loss of nearly $9,000,000 to so many of our lessor but very important manufactures fails to indicate a healthy trade condition, great as the gain may have been to an over protected few. The real question is, was the export trade of the great mass of our manufactures properous? The figures show the contrary, while our farmers will find but little consolation in a loss of $33,000,000. It is likewise true that the ostensible gain in "manufactured" products, $91,000,000, of itself is misleading in another respect. Included in the gain of manufacture is found bar and pig copper, the increase of which amounted to $29,000,000. Deduct that and the increase of exports of manufactures was only $62,000,000 consisting principally, as has been said, of three items so heavily protected that their surplus can be forced on foreign markets at cost.

The condition then, as far as agriculture and many other classes also of our manufactures are concerned, was not satisfactory.

Agricultural exports suffered severely.

Let me call attention to another resume concerning the ability of these great manufacturers to export.

"Since last April, Japan has purchased in the United States more than 200 locomotives, 5000 railway cars, 400 structural iron bridges, and 50 or more steam turbines, with electric generators. On the other hand the United States is by far the most generous customer of Japan's silks, teas, mattings, and curios, buying four or five times as much as does Great Britain.

"This flood tide condition of the iron and steel industry—the mills everywhere working up to their capacity with contracts far ahead—lends extraordinary significance to our export trade in iron and steel manufactures. This trade has been steadily increasing. Its amount was $118, 948,586 in the fiscal year 1904, and $134,727,921 in the fiscal year 1905 —ending on June 30th," practically the same results that I have reached.

A great deal has been said about the ability of certain of our manufacturers to compete with the rest of the world. That is what we have been working to enable them to do. We want them not only to be able to compete with the rest of the world in our own market, but to hold the domestic market and to compete with the rest of the world abroad. When that time is reached then we claim that attention should be paid to the necessity for agricultural exports and that concessions be made to the manufacturers of foreign nations in order that they may continue to buy our agricultural products. When manufacturers are able to flood the world then let us have a chance. That is the attitude that the agricultural interests practically occupy. .

Now I have heard a great many distinguished gentlemen deny, that the surplus was of any great importance, and say it did not make any difference at what price it was sold. I noticed a speech of Mr. McCleary of Minnesota in which in replying to Governor Cummins he said, what if there is a little export of 3 per cent less than what is sold at home? It is the surplus all the time that is the barometer that shows the condition of any industry. It is what is sold abroad that indicates what can be done. We say that the surplus that the iron manufacturers have sold abroad is no small item, it is an enormous amount. What was it selling at? I have had a little personal experience with regard to that. I feel sure they do not sell a pound abroad at a loss, I assume that as a fixed proposition. They are not going to ship anything abroad to sell at a loss. I believe in some cases they sell it for less than they do at home here—I know it, because I have bought of them abroad. I believe in a majority of cases however, that the reduction in the labor cost of our manufacturers has been so great, and the superior excellence of our machinery has been so marked that we are able to meet on a fair basis the manufacturers of the world, and that we can undersell them and still make a profit. So I say the same thing can much better be done at home.

Here is an address which I cut out of the "Iron Age", certainly a good authority, an address delivered by William M. Pratt, at a recent convention of the American Hardware Mfgrs. Association. I will not attempt to read it all, but he says a good many things.

"Reciprocity, which means a mutual interchange of rights and privileges, has been criticized in the abstract and condemned in the concrete." That is a quotation from your distinguished Governor, who is one of the leaders in this movement. "As having a bearing on the commercial relations between individuals it is necessary to commercial success. Having been dragged into politics it has been so mercilessly abused by both political parties that hardly a semblance of its real meaning remains. In the days of Blaine, when Reciprocity was spoken of, as a hand-maiden of protective policy, it was assailed by the Democrats as a farce and misnomer, and when a certain element of the Republican party, realizing the country's commercial need, attempted to use this policy for our advantage in foreign markets, they have been termed traitors to the cause of protection.

"Are the great commercial interests of this country to stand idly by and allow a policy which is essential to our success in foreign markets to be mutilated in policies? Gentlemen of the Manufacturers Association, each and every one of you who has an export trade at this time, or ever expect to have one is vitally interested in this matter. No one, not even the foreign buyer, questions the wisdom of a protective tariff, neither does he object to any individual schedule, which the needs of revenue, or the protection of labor requires. He does object to a policy under which we desire to sell everything and take nothing. He does object to schedules which are far higher than the needs in the case warrant."

Now it is very gratifying to me, and I presume to all of you representing agricultural interests, to find that a very large and powerful element of the manufacturing interests are allied with us in this movement. They feel the need of greater markets, they have reached the question of their surplus, and find the market abroad is as essential to them, as to us. It is only a few of the great manufacturing interests that are standing in the way, and which as Mr. Roosevelt says insists on keeping their feet in the trough. The great iron and steel interests the manufacturers of rails, all ship plate and all structural iron particularly. Everywhere men are beginning to see that we can sell an enormous quantity of our manufactures abroad.

In 1892, I made my first visit to England and Scotland, and I was surprised to find in every Scottish Village American axes and saws and nails for sale, for less than I could buy them in Kansas City. In 1902, I visited the Royal Agricultural Show which was held that year at Warwick, on the grounds of Warwick Castle. They number everything that is on the ground, put it in a catalogue and if it is for sale, the price is given, and I found almost every agricultural instrument I am acquainted with for sale on the grounds at that place in 1902, for less than they could be bought for in Kansas City and I brought back a catalogue and had it verified by implement dealers in Kansas City. In 1903, I was over there again, and I found in every town of consequence in England, American shoe stores, an enormous sign "American Shoe Store", and I found I could buy American shoes of precisely the same character that I had been in the habit of buying in Washington for about 20 per cent less than I could buy them in Washington. I found barbed wire for sale in Liverpool for $2.50 a hundred when it was $2.75 a hundred in Kansas City. And so on. If they can sell it at a price, that I know is at a good profit over there, then we can ease up a little, on these demands which they make for us on this prohibition of competition from abroad in some articles. If they can compete with the world in the worlds markets, let them compete with the world in our domestic markets somewhat, and thereby encourage the purchase of agricultural products, for foreign supplies. What does Mr. Pratt say as to that point?

"There are two phases of this question to which I shall for a moment ask your attention; both are economic. The first has to deal with the effect upon our manufacturing interests of the continued selling of raw material, machinery, finished goods, and other exported articles at lower prices to foreign consumers than they are sold in home markets. This question is one of grave depth; it needs careful consideration. To what extent this is done I am not prepared to say; that it is of almost universal practice I have full knowledge."

That is a statement made by a great hardware dealer to the association of American Hardware dealers. Is it possible that it would not have been challenged if it had not been true? But it is true. Now we simply want a fair deal. That is what the interests of this country, from the agricultural and livestock point, demand. I have heard some gentlemen who argue on the other side challenge the statement that any of our duties upon foreign imports are too high. They say that it is asserted of course by those who would import products into this country that they are not too high. Let us look for a moment at the actual facts and leave it to the unbiased and honest opinion of men as to whether or not that was true. Here are some pages I tore out of the statistical abstract, for 1904. I merely want to call your attention to one or two schedules. This gives the average duty paid on all the imports of certain schedules. Of course it is very much lower than the highest duties, because but little is imported if any where the highest duties come in. Take the cotton manufactures and the imports of cotton manufactures for the year ending June 1904, was $48,901,815. And the duty actually paid upon those imports was $26,300,000, or a duty of 53.78 per cent. We grow the cotton, we have the finest cotton machinery in the world, we have invented everything from the cotton gin up to the highest power loom, and yet our cotton manufacturers exporting as I have shown you an enormous quantity of cotton goods, we will bar out anyhing that can be made abroad by a duty on an average of 53.78 per cent.

In earthen, stone and china ware, another schedule which concerns the average life of every farmer in the country, we imported $11,905,434 worth upon which they required a duty to be paid of $6,963,622 or 58.49 per cent. Isn't that an unnecessary duty in this day and generation. It might have been asked for 25 years ago. On glass, which is another thing,—and mark you, the freights upon earthen, stone and china ware, and upon glass are enormous handicaps to the foreign importers—of glass we imported $6,404,201 and we paid upon it a duty amounting $3,918,283 that is we charged it to the importer and divided it up, whenever we bought any of the imported article, a duty of 61.18 per cent on glass. The labor involved in glass manufacture in this country is an insignificant amount comparatively, and we could afford to buy all the glass works and burn them up and destroy them and make money by it, and then have a chance to buy abroad.

In tobacco and manufactures of tobacco, we of course are the greatest growers of tobacco on earth. It is an agricultural product, and I am willing to let the blame fall even upon an agricultural product; but it is chiefly in manufactures that this enters. We have an average duty of 118 per cent upon all of the manufactured tobacco imported. And I want to call your attention to just one more and that is to the iron and steel schedule, where we have been importing such enormous quantities. There we have a duty. We imported $26,277,690 worth of manufactured iron and steel. Upon that we paid a duty of $9,651,240, an average duty of 36 per cent. Now in the manufacture of iron and steel we encroach upon Germany tremendously. She manufactures cheap guns, cheap cutlery, cheap knives, cheap scissors and things of that kind, and we have slammed the door in her face by our excessive duties upon that class of goods. That is of course applied to things that we do import. Where it is not absolutely beyond the possibility of doing any business. I want to call your attention to some schedules where this is absolutely prohibited. Tom Reed in the last campaign he made for Congress in Maine said, that there are two classes of people that this country has no use for, they both would starve the Government; one is the free trader, who does not want to collect any revenue, and the other is the exclusionist, who does not want any imports, and therefore prohibits by high revenue. They would reach the same end, they both starve the Government and injure the people.

Now for Treasury Statistics:

Chalk, such as tailors, billiard, lead or French, 106 per cent duty, $34,000 imports, $36,000 duty. Boracic acid, which is an article of ordinary use, we have I believe the two greatest borax mines in the world, the duty is 122 per cent. We imported $30,000, and paid a duty of $36,000 on it.

Tannic acid or tannin 103 per cent duty.

Nitric spirits of ether 250 per cent duty.

Sulphuric ether 236 per cent duty.

Cotton duck, over 8 square yards to the pound 112 per cent duty.

In manufacture of cordage there is another case where the duties are abnormal. Cables of fibre of 7 lea yarn, 108 per cent duty; another size 128 per cent; still another 150 per cent; a fourth 236 per cent; a fifth 300 per cent; as a matter of course we do not import any cordage of that kind.

Gill netting, five lea yarn 148 per cent duty, $1,980 imports, $2,940 duties.

Even fire crackers pay 126 per cent duties, as if we could not manufacture fire crackers in competition with the world. Cheap spectacles 116 per cent duty, common window glass, which is the kind ordinarily used 24 by 30, 107 per cent duty, we imported $55,000 worth and the duty paid was $59,000; 24 by 36, 125 per cent duty, $52,000 import, $65,000 duties; 30 by 40, 129 per cent duty; above 40 by 50, 255 per cent duty. As a matter of course we imported none of that.

Looking glasses, 24 by 30, 130 per cent duty. Plate glass 24 by 60, 142 per cent duty. Pocket knife blades 103 per cent duty. Stocks for double barreled guns 389 per cent duty.

On certain grades of cane sugar, the duty runs as high as 120 per cent.

Now those are the absolute facts, that is the situation. Mr. Blaine told us years ago he succeeded in having added to the McKinley bill of 1890 certain provisions of reciprocal trade relations with South America that are of enormous benefit to us, it has been proven to us over and over again. Mr. McKinley at the time when death itself was hanging over him told us the greatest truth in regard to this great question that has ever been uttered. He said the period of exclusiveness is past, and that we must buy of others, if we would expect them to buy of us. That was the plain homely, practical everyday theory that controls us in all our private relations, and no man will do business with his neighbor unless his neighbor will do business with him; and it is as true in National affairs, as in individual affairs. Mr. Dingley in framing his bill—and I remember the discussions, thought that section 4 would absolutely open the way to a settlement of all cases, and I believed so. It was practically the inauguration of the maximum and minimum tariff idea, it was an inauguration if it had been practically carried out by the senate as they had practically pledged themselves to do, because I consider that when the Senate voted for that law, with that provision in it, when they authorized Mr. McKinley to make these treaties, they were in honor bound, unless they could show a most grevious failure in the treaties, to ratify them and carry out the law. That was an act of bad faith, and I believe the people of this country may hold them responsible for it. They should re-enact by a joint resolution section 4, reviving it and authorize the President again to undertake negotiation of these treaties and to give us that kind of relief. Of course those of us who have been interested in this matter of reciprocity have reached the conclusion that the only proper and ultimate way of settling this question is by inaugurating a maximum and minimum system of duties which was pointed out and would have worked under the Dingley Law, if it was carried out properly. We could have gradually had a conventional rate twenty per cent less than the statutory rate, there would have been the two duties, a maximum and minimum. We ought to have the executive authorized to apply the minimum whenever reciprocal concessions can be obtained that justify it from any nation, without additional legislation; he should not have to go to Congress, he should not have to bring up this great question for general discussion. I agree that it is unwise to have unstability, I agree that a general discussion of tariff is liable to create some harm and some uncertainty: But if it must be done, and all agree that sooner or later it must be done, when is the time to do it? When the sun is shining and everything is fair? Or shall we wait until the clouds gather and open and the rains begin to descend and then attempt to build an ark of refuge? There were men who laughed at Noah, who said he was an old fool, even though he had a tip from the weather bureau. They said it wasn't going to be much of a shower anyway.

Then there is another famous gentleman known in history who lived in Arkansas, he would not mend his roof when the weather was clear and bright because it did not need it, and he could not do it when it rained. Should we imitate that class of people? Or shall we with business sagacity take the steps necessary to build up our business with other nations?

Mr. McKinley and the Dingley bill never said anything about noncompetitive products. How can you have reciprocity in non-competitive products? We have nothing to trade on in them. But the Dingley bill in section 4 provided for concessions upon the whole schedule. Section 3 provided for half a dozen articles that are not altogether noncompetitive, but they are mentioned specifically by name. And to-day

Mr. Root is trying to negotiate under that section, but he will have to apply to Congress to increase his powers in that connection before he can make a satisfactory treaty with Germany.

Gentlemen, I hope I have not tired you. There is an immense amount of material, and argument and proof, which I might present to you with regard to these things, but it is a good business proposition. You have your agents in Washington to do business for you, they are sent there by you as your agents to attend matters that affect your business interest. Here is a condition which is confronting us. I believe that in a year from now the livestock industry, unless we do something to relieve the situation will be absolutely ruined; I do not see anyway out of it. We cannot feed all our corn to our daughters, nor all our beef either. We have got to sell it abroad, we have got to have an opportunity. War was threatened with Spain because she closed the mouth of the Mississippi river. We wrenched her power away, in order that we might have access to the world. That system of taxation was injurious. Here is another system of taxation on both sides, it is an international affair, but we are asked to do what is fair and right and best for our own people. The question is, shall we do it?

I thank you gentlemen.

Vice-President Cameron was then called to the chair and President Morrow addressed the convention as follows; which was followed by the report of the Treasurer.

PRESIDENT'S ADDRESS.

HON. W. W. MORROW, AFTON, IA.

The statement has been made at each annual meeting for the past few years that the fair just closed was the most successful in its history; and while this is true of the past, it is especially true of the fair of 1905. With bounteous crops, the people in a prosperous condition, and with perfect weather, the fair this year was not only the greatest held in this State, but surpasses any ever held in the United States. Many times some of the departments are well represented and others are but partially filled, but this year all departments made a fine showing.

About seven hundred cattle were in the show ring. The capacity of the barns being five hundred, additional space was made by converting the old poultry building into a cattle barn, accommodating ninety-six head; the balance were cared for in tents. New cattle barns should be provided for the coming year. The management was compelled to build more pens for the hog exhibit, also to refuse to receive further entries. This exhibit numbered about twenty-five hundred head, and if the entries had not been closed we would probably have had three thousand or more hogs. A new hog barn should be built, suitable to care for at least twenty-five hundred head, and the best pens now in use could be used for an overflow.

A new steel amphitheatre should be provided for. Many other improvements are needed, which can be provided for later.

On November 1, 1904, there was cash on hand $29,658.22, $15,000 of which was placed as a reserve fund with the Marquardt Savings Bank, drawing four per cent interest. One thousand two hundred dollars was expended for improvements, which included turnstiles, hay barn, cement walks, repairs on agricultural building and streets, wire fencing, curbing and guttering, changing entrance to amphitheatre, building new entrance at Grand Avenue, changing poultry building into a cattle barn, changing old dairy building into a dining hall, and other improvements which the Secretary will give you in his report of expenditures.

On November 1, 1905, there was on hand $39,733.40, making a gain for the year of over $10,000. More money could have been taken in in the Privilege Department had we allowed shows of a doubtful character on the grounds; but I am pleased to say that the day of the fakir and immoral show is a thing of the past at the Iowa State Fair.

REPORT OF THE TREASURER.

FOR THE YEAR 1905.

G. D. ELLYSON, DES MOINES, IOWA.

Gentlemen: Herewith please find report of your Treasurer for the year 1905:

	Receipts	Disbursements
Cash on hand	$ 29,657.23	
Gate receipts	47,906.00	
Amphitheater receipts	7,220.05	
Quarter Stretch receipts	403.75	
Evening admissions	936.75	
Evening amphitheater receipts	4,432.00	
Special tickets	295.50	
Campers tickets	978.00	
Sup't of Privileges	9,315.75	
” ” Horticulture	5.00	
” ” Agriculture	118.00	
” ” Swine	1,189.00	
” ” Sheep and Poultry	221.30	
” ” Horses	511.00	

" " Fine Arts	371.75	
" " Dairy	767.65	
" " Grounds	1,787.21	
" " Electric Lights	126.00	
" " Cattle	920.50	
" " Machinery	1,101.75	
Secretary	8,109.59	
State Appropriation	1,000.00	
Interest	910.62	
Total	118,284.40	
Expense warrants		$ 49,685.08
Premium warrants		28,622.98
Balance		39,976.34
Total		118.284.40
Balance on hand Nov. 30, 1905,		$ 39,976.34

Respectfully submitted,

G. D. Ellyson,
Treasurer.

On motion the convention adjourned to meet at 1:30 P. M.

AFTERNOON SESSION.

The convention met at 1:30 P. M., pursuant to adjournment, with President Morrow in the chair.

Secretary Simpson read his report as follows:

SECRETARY'S REPORT.

J. C. SIMPSON, DES MOINES, IA.

Before my report proper, I wish to say a word regarding the state fair as a factor in agricultural education. We find upon looking over the resolution passed by the first meeting held for the organization of a state fair, in the first paragraph, the following: "For the promotion of agriculture, horticulture, manufactures, mechanics, household arts and the improvement of live stock." This is the foundation upon which all agricultural and stock fairs are organized. That the state fairs of the middle states have been a great factor in the improvement of our live stock, agricultural products and farm implements, we believe will be conceded by all fair-minded men. It is the object lesson taught by showing side by side for comparison which stimulates the effort for improvement, and this is where our fairs have been a factor in the education of the farm folk. It matters not that all agricultural fairs have not followed up the true principle of its organization, or that many fair-goers see only a frolic in the event; the thinking men and women who keep their eyes and the avenues of their brain open understand that education of the farm folk is the underlying idea of the state fair; all else is incidental and of more or less importance to its financial success.

That the usefulness of our state fair is still in its infancy can readily be seen by a glance at the live stock statistics of the state census now being compiled by the Secretary of the Executive Council. The total number of cattle in Iowa is reported at 4,756,322, or which only 86,838 are pure bred, being less than one in fifty, or under two per cent. The average value of all cattle, including calves under one year old, is about $19.34, while that of pure breds is $59.95, an average greater by more than two hundred per cent. Pure bred cattle being worth on an average three times that of scrub animals should be sufficient evidence to convince the most skeptical of the positive necessity for greater efforts in further improving the quality, thereby greatly increasing the value. I do not believe it an impossibility within the next five years, by a more general use of high class, pure bred bulls, to increase the value of our cattle $5.00 per head. This would mean a total increase of nearly $25,000,000.00 on the number reported at this time.

The number of swine, all ages, is reported at 6,465,580, worth on an average $5.27. The total number of pure bred swine is 110,421, worth on an average $12.63, being more than double the average value reported on other swine. An increase of twenty-five per cent on the average value of hogs would mean a total increase of over $8,000,000.00 for the Iowa hog. Following this up on all classes of live stock, you would have a possible increase of $40,000,000.00 in the value of stock in the state of Iowa in the next five years. This is where the educational feature of the stock exhibit at the State Fair is most apparent. What farmer is there in Iowa who can pass through the swine department at the State Fair, where more than twenty-five hundred hogs are shown, and not be impressed with a feeling that an improvement in his own herd must be made, and possibly lay the foundation then and there for this improvement by purchasing a pure bred boar of good quality, or perhaps a few gilts. I appeal to you, Mr. Farmer, if there is one among you who can sit in the magnificent stock pavilion at the State Fair grounds, watching with the eye of an expert the work of the awarding judges, and then go home without a determination to breed better cattle in the future. If you are not directly interested in the breeding of cattle or very closely identified with the work, or in other agricultural pursuits, I can readily see how your only purpose for visiting the fair is for pleasure.

It has been the policy of the Board the last few years to provide the highest type of entertainment for the people, believing explicitly in the old proverb that "All work an no play makes Jack a dull boy," in that "All education and no amusement makes the fair a dull place." A good entertainment will insure a greater attendance and more revenue, without which the educational features must be sustained in a beggarly manner.

In the minds of a large number of farm people, the State Fair ranks with other state educational institutions, and they believe it should have the same hearty, earnest and liberal financial support for the construction of permanent buildings. It is true the fair continues for only one week, but in that length of time it is visited by over 150,000 people. It furnishes an object lesson for all classes and ages. It gives them an opportunity to learn what they cannot learn elsewhere, and at the same time a pleasant outing at a nominal expense after the season of hard work. Our schools and colleges are for the young, the fair is for the young as well as for those who have passed the school age. Therefore, we say, whatever can be done to make our fair more instructive, more educational and more comfortable, should be done.

Permanent location and permanency of improvements is the success of any state fair. The Iowa State Fair in former years was held in the different cities throughout the state, and until its permanent location in this city was rarely a financial success. This was true of the state fairs of Wisconsin, Illinois, Minnesota, Missouri, Ohio, and in fact, all that have come within our observation. When the present grounds were purchased and the fair permanently located in this city, Des Moines business men raised and donated to the state the sum of $50,000. It has been customary for the different towns and cities throughout the state, when a state institution was located in their city, to either donate the grounds or a sum of money equal to their purchase price. But it was never the intention of our state that the city or town should provide the means for future buildings and maintain the institution after once being located. Do you expect the people of Iowa City to erect all the university buildings and maintain that institution because of its location in that place? Did you expect the people of Council Bluffs to rebuild the deaf and dumb school in their city? Would you expect a town to build a new court house and pay the expense of its county officers because of the location of the county seat? Is it not just as unreasonable to ask the people of Des Monies to build the buildings and make the improvements on the State Fair grounds because the State Fair is located in their city? The fact that such states as Wisconsin, Minnesota, Ohio, Illinois, Indiana, Missouri and other states are making provision for the permanency of their state fair is a precedent which I believe can be safely followed. The people of Iowa are back of the state fair, if it was otherwise it would not, and could not, be a success.

Within the next few years provision should be made for a number of buildings and improvements on the State Fair grounds, if the Iowa State Fair is to continue in the front rank with like institutions of other states. As compared with Illinois, Ohio, Minnesota, and even Missouri, the improvements on the Iowa State Fair grounds are far behind However, nature has done more for our grounds than any I have ever visited; and we have great faith that the future general assemblies of Iowa will do as much.

It was my pleasure to visit the State Fair grounds at Columbus, Ohio, a short time ago, and I was much impressed with what I saw there in the way of buildings. Instead of a large number of frame and temporary buildings, they have seventeen permanent exposition buildings. Their hog show is all housed under one roof, with a show ring in the center, and this building is a model of beauty and convenience. The same is true of their other stock barns. Mr. Miller, their secretary, informed me that since these barns were erected the show of live stock has increased seventy-five per cent, and the exhibit is the center of interest to the vast throngs of visitors to the fair. They have three large, roomy sheds for the implement and machinery exhibit. In fact, the whole of their exhibit is under cover. The Illinois state fair grounds are even better equipped, in that they have covered walks connecting all their main buildings. Leaving the train one enters the immense implement sheds, passes, through this to the Dome building, where the agricultural and horticultural exhibits are displayed, then passes on to the exposition and womens' buildings, and from there to the poultry building and stock pavilion without once being from under cover. Thus you can see why inclement weather will not materially interfere with the Illinois State Fair.

I cannot pass over this matter of improvements without a word in regard to the urgent need of a fireproof grandstand. Those of you who were present at the last fair remember something of the immense crowd that packed the grandstand and quarter stretch on Wednesday afternoon. It was on this day that a fire broke out in an eating house five or six hundred feet to the east of the grandstand. To the people in the grandstand nothing was visible but a vast volume of black smoke, but this was sufficient to cause a feeling of uneasiness, knowing the inflammable material of which the grandstand is built, and when those outside began crying "fire," this feeling of uneasiness amounted to almost a panic. Only those who were facing the stand and saw the tremor that swept like a wave over the immense throng occupying it, can appreciate by what a narrow margin was averted a catastrophe greater than Iowa has ever seen; a panic which would have resulted in the death of hundreds of people. This was only averted by cool-headed persons and a statement that it was a fake, being only a demonstration by the fire department stationed on the grounds. This incident should be a warning and a lesson that should be heeded before it is too late. Human lives are too precious to take any such chances. The amusement feature of the fair is legitimate, and the immense crowds that witness this feature is made up of the flower of Iowa's population, the wives, mothers, daughters and sons, not only of the rural districts, but from our cities and towns as well. I have in my desk a clipping from a newspaper of a fire which destroyed a grandstand in an Ohio town last fall and many people were injured in the panic, and this with only a few hundred people present.

We wish to correct any erroneous ideas which you may have in that the State Fair is not self supporting. The State Fair is now, and has been for the last eight years, self supporting. During the past six years more money has been expended for improvements on the State Fair grounds out of the receipts of the annual fairs, after paying all expenses and premiums, than has been received by direct appropriations for buildings. Can this be said of any other institution in Iowa? Later on we will give some figures bearing out the above assertion.

The fifty-first annual Iowa State Fair marked a new era in its growth. Never was such an exhibition of live stock, or of farm impements and agricultural products gathered at a state fair. It was a triumph of perfection as compared with preceding State Fairs. It has grown into an annual exposition of the products of the State, the greatness and number of which make it impossible to more than view that part in which one is directly interested. It is not an uncommon practice now for a visitor to devote his entire time to one of the numerous departments. The fair was cleaner than ever before, and every available foot of exhibition space was occupied. Indeed, the entries were so numerous and the applications for stalls so great as to cause the management quite a little concern how to provide for all. But even in the midst of this worry we could find pleasure in the thought, that more applications for stalls and pens would mean a greater show, and a greater show would mean a larger attendance, thereby insuring a greater success.

The grounds were in the best of condition, never being more beautiful than on the opening day. During the week the fair was held the weather was perfect and the attendance greater than ever before by many thousand. The total attendance for the week was something over 162,000.

In the line of amusements, the management provided the best that money could obtain, and were especially fortunate in being able to secure the services of one of the most famous concert bands in the country. The sacred concert rendered by Liberati's Band at the fair grounds on Sunday afternoon will long be remembered by those who were fortunate enough to be present on that occasion.

A very pleasing feature of the stock exhibit this year was the large increase in the number of entries made by Iowa stockmen. This was especially noticeable in the horse department. Every stall was taken, and not one of the large foreign horse companies that assisted in making the record breaking show of two years ago had entries. As it was, the exhibit was very satisfactory in every way. The American people are less versed in the scientific principles of breeding horses than in any other class of stock, and the need of work along this line is very great. Every effort should be put forth on the part of the State Board of Agriculture to increase the interest in the horse exhibit at the State Fair and encourage the showing of a greater number of American bred horses. The breeding of horses will never be as profitable as it should until our people learn that a high class brood mare is as essential in the raising of a good colt as is a high grade, well bred cow in the raising of a good calf. To accomplish this, better brood mares must be used, and I hope to see the time when the show of brood mares and fillies in the ring at the Iowa State Fair will be as numerous as the stallions and colts.

No better herds of cattle were ever entered at any show, nor a larger list of entries received, than in the breeding classes at the fair this year. It was an exceedingly strong show in all breeds having a classification in our list, as was shown by the wide distribution of premiums. The showing of Shorthorns, Herfords and Angus in the beef breeds were the strongest, the Galloway, Polled Durham and Red Polled being well represented. In the dairy breeds but two classes were shown—Holsteins and Jerseys, the showing of Jerseys being the strongest in years. In all, seven hundred and seventy-eight entries were received, and out of this number about seven hundred were at the fair. Figured on a basis of ten animals to each exhibitor, this would make a total of seventy cars of cattle. And such cattle as they were! Great massive animals representing the finest type among their respective breeds. It was certainly a paradise for the lover and breeder of cattle. Nowhere throughout the whole land was there ever such an oportunity for the farmer to study the breeding and types of the beef animal. What an object lesson for comparison! What an opportunity to converse with the most intelligent breeders and expert judges of our country. To those who were present and failed to get the full benefit of this, the greatest showing of breeding cattle ever before gathered at one place, we can only feel that they did not use their sense of sight, feeling, and—well, you can come again next year and make up for this lost opportunity, for if all signs do not fail, there will be a larger and better show than ever.

If the Iowa State Fair has a reputation the country over for the number and quality of cattle shown each year, it is none the less known for her swine exhibit. And what is more befitting in a state with double the number of hogs of any other, that at her annual State Fair the swine exhibit should be in the same proportion. More than twenty-five hundred head of hogs were on exhibition this year, and the number was only limited by the lack of room to erect more pens. In all, probably six to seven hundred were turned away by this lack of room to provide the necessary pens. The quality was much better, showing that rivalry among the breeders is growing keener each year. The showing of Poland Chinas was the largest—ten hundred and ninety-one being shown by more than eighty-five breeders, all but fourteen being from Iowa. Duroc-Jerseys came next—seven hundred and ninety-three, representing the herds of fifty-four breeders, all but ten being from Iowa. The Chester Whites came next in number, there being four hundred and seventy-five, shown by twenty-five breeders, all from Iowa. Then came the Berkshires, the six breeders in this class having one hundred and eleven in the show. Thus the show of two thousand four hundred and seventy hogs was made by one hundred and seventy breeders. There are hundreds of farmers and breeders throughout the state who wait until they come to the fair before purchasing whatever boars, sows or gilts are needed to strengthen their herds. There have been times in the past when eighty per cent of the swine on exhibition changed ownership before leaving the grounds. The condition and arrangement of the barns or sheds in which this exhibit is quartered, and a lack of a show ring of sufficient size, detracts somewhat from this show. With new quarters for the hogs, conveniently arranged both for the exhibitor and the visitor, the show would increase in value many times and be one of the most interesting and attractive places on the fair grounds.

Iowa is not a sheep state, and considering the small number raised within her borders, the show at the fair was exceedingly good, both in number and quality. The Board has offered inducements in the way of special classes to Iowa bred sheep, and this should strengthen the show materially in the next year or two.

The poultry exhibit was good, but not what it should be. The money received from the sale of poultry and eggs by the wife has tided many a farmer over a financial crisis in his affairs. The total number of poultry of all kinds reported from the Iowa census now being compiled is 23,470,059, worth $8,083,184. The number of dozen eggs produced in each year is given as 79,456,462, worth $10,794,193; this added to the value of all poultry makes a total of $18,877,377, a sum equal to more than one-half the value of swine, and one-fifth the value of all cattle. It is astounding, the returns that can be derived in a year from a flock of one hundred to two hundred chickens with proper care.

In the display of farm implements and machinery was to be seen the progress made in the last decade by the manufacturer in his effort to satisfy the people. Here you could see nearly every kind of farm implement, tool, machine or conveyance known to man, representing the products of many of the leading mills and factories of the middle west. All classes of people, from the dealer to the small school boy, seemed to be intensely interested in this exhibit. The factories had their experts on hand to explain the intricate parts of the machine and demonstrate its capacity to do the work for which it was intended.

In the agricultural, horticultural and dairy building the show was even better than expected. This was more particularly true of the horticultural exhibit, which, considering the unfavorable season for fruit, was especially good. The visitors seem to take a greater interest in these exhibits since the erection of the new building, it being crowded from morning until night. Several large beds of foliage plants and flowers had been planted around the building, making a very attractive corner of the grounds. Special attention should be given by the management to landscape gardening. This can be carried on at a nominal expense, and would certainly add much to the attractiveness of the grounds.

The camping feature of the State Fair is becoming quite popular again. During the fair hundreds of tents were put up on the camp grounds and were occupied by several thousand people. It is the most pleasant and enjoyable way to see the fair, and the expense is much less than to stay at the hotels in the city. Tents can be rented of the tent and awning companies, who are located on the grounds during the fair, at a small expense, and if ordered ahead, will be pitched and ready to occupy upon arrival.

The finances of the department are today in the most satisfactory condition they have ever been. About four years ago the board passed a resolution to the effect that a part of the cash in the treasury be set aside, to be used only as an emergency fund. This action was taken as a precaution, that they might have available funds to be used in case of misfortune to any of the fair ground buildings and to insure the prompt payment of all permiums. At each annual meeting since that time, similar action has been taken. The money on hand, after deducting the amount of the emergency fund, has been appropriated and used in the improvement of the fair grounds, increasing the amount of premiums, the contingent expenses preceding the State Fair. This precaution of the board in thus creating an emergency fund, and the promptness in the payment of premiums, has given stability to the Iowa State Fair that has been of untold benefit in increasing the number of exhibits.

The past season $12,000, in round numbers, was expended for improvements upon the fair grounds. Registering turn-stiles were installed at all entrances; additional improvements were added to the agricultural building; a new barn was erected for the forage department; the streets were improved by placing upon them hundreds of loads of cinders; additional walks were put down; several hundred rods of seven foot woven wire fence were built; a start was made in curbing and guttering the streets; changes were made in the entrances to the grand stand and arrangement of the aisles; several barns were re-shingled; and a large number of buildings painted. The old dairy building was converted into a first class dining hall, and the old poultry building into a cattle barn. An imposing entrance was built at Grand Avenue, and a number of other improvemets of minor nature constructed, as will be shown in the detailed statement later.

As to receipts, our statement will show that there was a cash balance on December 1, 1904, of $29,657.23, and on Noveremher 30, 1905, the close of the fiscal year, $39,976.34, with unpaid warrants of $196.-17, leaving us a profit and loss balance of $39,780.17 or a net increase for the year in the profit and loss account of $10,179.30. Our statement will further show total receipts from all sources during the year of $88.627.17. that there was received from the sale of tickets at the State Fair $62,172.05, and from other departments of the fair $22.502.20, making a total of $84.674.25 receipts from the fair and $3.952.92 from all other sources.

The statement of disbursements will show that there was drawn during the year, premium and expense warrants to the amount of $78.447.87.—$28.730.89 for premiums. $33.720.08 for expenses of the fair. and $15.996.90 for improvements. insurance. expenses of state farmers' institute, salary of the superintendent of the fair grounds, etc. Also that the total disbursements of the fair were $62.450.97. leaving a net profit of $22,223.28. It will show an increase in the receipts in nearly all departments, particularly in the ticket sales and privileges; the increase in the ticket sales amounting to $13.628.40 and the increase from the sale of privileges to about $3.000.00.

Quite a large number of improvements and changes are needed, a number of which can be provided for out of the funds now in the treasury. Presuming the Board will see the wisdom of continuing the emergency fund and that it will not be less than for the past two years ($15,000), and estimating the money necessary to pay the bills contracted and presented for payment before the next fair at $4,000 to $5.000, will give a working fund of about $20,000. After deducting the amount of any increase in the premium list, the balance will be available for improvements and repairs. This sum will not be sufficient to provide for all the improvements which should be made the next season.

Another cattle barn should be built to give the necessary stable room without resorting to the use of a tent, which does not make a desirable place to house cattle and is very dangerous in case of storms. Another sanitary closet is needed near the camp grounds. Aside from the fence put up the past two seasons, the outside fence is in very bad condition and about six hundred rods of additional fencing should be built. The fence which is being used is a seven foot woven wire fence and is quite expensive to build, but when put up right it will last a number of years. More walks should be laid, and some additional storm sewers put in. The streets and drives should be further improved by the use of cinders, curb and gutters. In our experience in improving our streets, the cinders have kept them in a better condition than any other material used. The lighting plant should be increased to double its present capacity. A telephone system should be installed; this would not only facilitate the work of the Board in their management of the fair, but would be greatly appreciated by the exhibitors and visitors to the fair. Provision should be made without further delay to better the conditions for furnishing meals at the fair. A number, in fact nearly all, of the buildings on the grounds used for dining halls belong to private parties. They have been there for a number of years, are very unsightly, and not fitted for the purpose for which they were erected. They were put up in the cheapest kind of a way to begin with, and their appearance has not improved with time. With a number of neat, well built dining halls, the revenue from the sale of privileges would be increased very materially. In case a new grandstand is secured, the salvage in lumber from the old stand could be used in building these dining halls. We cannot call to mind any one thing which would be appreciated more by those attending the fair than to provide a few additional dining halls where a good, wholesome meal could be secured. Some one has said that "the way to a man's pocket book is through his stomach," so why not get on the right track? Never since the exposition building was put up has there ever been much effort made towards any changes which would make it a desirable exposition building. It will be years, probably, before a new exposition building is secured; in the meantime, by an expenditure of five to six thousand dollars, it could be remodeled and made into a very good building. At present the fair grounds are without adequate fire protection. During the past season the water works company have extended their mains to the grounds, and if brought into the grounds, and a sufficient number of fire plugs distributed, all main buildings would be in reach of water in case of fire.

The above are only a few of the countless number of improvements necessary on the fair grounds, but will give you a clearer idea of the work that is contemplated and how utterly impossible it would be for the management to have the means with which to build large permanent buildings, such as a grand stand, hog barn, manufacturers building, etc., without an appropriation for those specific purposes, and make the other improvements that have been made in the past and those which will have to be made in the future. The State Fair is a large institution, and it requires money to put and keep the fair grounds in such a condition that the largest possible exhibits can be secured and the people cared for with the least possible friction.

Iowa not only leads all other states in the bushels of corn produced and the number of hogs raised, but, in my judgment, has an annual exposition or State Fair which stands at the head of all similar institutions, and comes nearer fulfilling the purposes for which it was created, in carrying out the principles of education. It has had, the past few years, the support of a large majority of the people throughout the state. This has been very gratifying to the management, who are only interested in its continued success, as every citizen of the state should be. It has been of untold value to Iowa in the past, and can be made even of greater value in the future; it benefits all classes alike.

Our books show that seventy-nine county and district fairs received the state aid the past season, a total of $15,086.27 having been paid out by the State Auditor for this purpose, or an average of $190.96 to the fair. There are held in the state between eighty-five and ninety fairs each year, but all do not apply for the state aid. The state pays to each and every county fair in the state complying with the law, forty per cent of the premiums paid, not including speed, not exceeding two hundred dollars to any one society. The table compiled from the financial statements sent in does not show much change in the table of one year ago, from one less report.

The total receipts from those reporting was $236,251.08. The amount paid in premiums was $55,505.93. The total valuation of the fair ground property as given is about $92,000.00. Eighteen societies reported no indebtedness; fifty-one report money on hand to the amount of $11,600.00. $1,757.15 was the greatest amount reported by any society as having been paid for premiums; this was from the fair at Columbus Junction, Louisa county. The Clinton District Fair leads in the largest amount received from receipts—$6,861.70. The complete financial statement will be printed in full in the Iowa Year Book of Agriculture.

I wish to call attention to one other matter in which we are all more or less interested, particularly as consumers, and that is pure food legislation. In all probability, a bill will be presented before the legislature this winter, calling for some regulation as to the adulteration of foods. A law of this kind should be upon our statutes. The committee of the State Board of Agriculture on adulteration of food and other products will have a bill drawn and ready to introduce early in the session, which should receive the support of all who are interested in the matter of better foods.

Following is a statement of moneys coming into my hand as Secretary and deposited with the Treasurer, for which I hold receipts:

From annual state appropriation for insurance and expenses	$ 1,000.00
From exhibitor's tickets	1,930.00
From scholarship contest	52.00
From speed entries	3,506 65
From Polled Durham Ass'n. specials	200.00
From Hereford Ass'n. specials	496.00
From refund by Board of Control part of expenses obtaining agricultural exhibit at St. Louis	143.09
From forage department	1,669.85
From miscellaneous collections	112.00
From interest	910.62
Total	$ 10,020.21

SECRETARY'S ACCOUNT OF GENERAL EXPENSE.

For the Fiscal Year ending November 30, 1905.

IMPROVEMENTS AND REPAIRS.

Agricultural Building	$ 700.08	
Streets	712.72	
Feed barn	488.87	
Fence	711.19	
Dining halls	171.95	
Exposition building	190 87	
Landscaping	185.19	
Womens' building	107.86	
Amphitheater.	573.85	
Curb and gutter	467.97	
Painting	461.23	
Walks	436.61	
Barns.	804.41	
Grand Avenue entrance	1,377 03	
Street car entrance	199.58	
President's office	326 28	
Swine pens	586.62	
Miscellaneous	3,460.78	$11,963.09

Auditing committee	54.90
Miscellaneous expense	493.81
Executive committee	520 50
Express, telegraph and telephone	230.49
Bills of former years paid 1905	169.68
Special committee work	488 44
Annual meetings	164.86
St. Louis exhibit	249.39
Insurance	1,665.93
Superintendent Fair grounds, salary	900 00
Miscellaneous expenses at fair grounds	3,867.55
Printing	1,508.84
Postage	538.00
Advertising	3,851 51
Board meetings	444.80
Privilege department	441.36
Forage department	1,831 50
Attractions	10,472 57
Secretary's department	828.25
Light and water department	551.37
Superintendent fair grounds department	290.69
Police department	1,799.75
President's department	100 20
Treasurer's department	688.30
Gate department	1,035.93
Ticket department	292 10
Press bureau	199 15
Horse department	428.25
Speed department	293.60
Cattle department	577.36
Swine department	311.90
Sheep and poultry department	295.05
Machinery department	263.55
Agricultural department	345.37
Dairy department	264.10
Horticultural department	241.60
Art department	494.85
Premiums paid out of expense fund	516.33
American Trosting association (Suspensions collected)	39.15
	$49,716.98

SECRETARY'S ACCOUNT WITH J. D. ELLYSON, TREASURER.

For the Fiscal Year Ending Nov. 30, 1905.

RECEIPTS.	DR.	CR.
By cash on hand December 1, 1904		$29,657.23
From S. B. Packard, Supt. Cattle Dept.		920.50
" M. McDonald, Supt. Horse Dept.		511.00
" R. S. Johnston, Supt. Swine Dept		1,189.00
" H. L. Pike, Supt. Sheep and Poultry Dept		221.30
" John Ledgerwood, Supt. Machinery Dept.		1,101.75
" H. R. Wright, Supt. Dairy Dept		767.65
" T. C. Legoe, Supt. Fine Arts Dept.		371.75
" R. T. St. John, Supt. Agricultural Dept.		118.00
" M. J. Wragg, Supt. Horticultural Dept		5.00
" W. C. Brown, Supt. Privilege Dept.		9,315.75
" Jas. H. Deemer, Supt. of Electric lights		126.00
" Jas. H. Deemer, Supt. Grounds, collections.		1,787.21
" J. C. Simpson, Secretary's Dept		10,020.21
Ticket sales		62,172.05

DISBURSEMENTS.

To expense warrants paid:			
1905 issue		$49,685.08	
To premium warrants paid:			
1904 issue	$ 46.11		
1905 issue	28,576.87	28,622.98	
To cash on hand November 30, 1905		39,976.34	
Total		$118,284 40	$118,284 40

OUTSTANDING WARRANTS.

EXPENSE:	Warrants previous to issue of 1905	$ 1.20	
	Warrants 1905 issue	31.90	
	Total expense warrants outstanding		33.10
PREMIUMS:	Warrants previous to issue of 1905	9.05	
	Warrants 1905 issue	154.02	
	Total premium warrants outstanding		163 07
			$ 196.17

PROFIT AND LOSS, NOVEMBER 30, 1905.

By cash on hand	$ 39,976.34
To outstanding warrants	196.17
To credit	$ 39,780 17

STATEMENT OF PREMIUMS PAID AT FAIR OF 1905.

Department A, Horses	$ 2,941.00
Department B, Speed	7,145.00
Department C, Cattle	7,274.00
Department D, Swine	2,179.00
Department E, Sheep	1,496.00
Department F, Poultry	731.50
Department I, Agriculture	1,943.50
Department J, Pantry and Kitchen	673.00
Department K, Dairy	637.69
Department L and M, Horticulture	1,251.70
Department N, Fine Arts	2,084.50

SPECIALS.

Iowa State College Scholarship, awarded in boys judging contest	200.00
Total premiums paid at fair of 1905	$ 28,556.89
Premiums paid on mature corn, December meeting, 1904	174.00
Total premiums paid fiscal year ending November 30, 1905	$ 28,730 89

SUPPLEMENTARY STATEMENT.

Total receipts for fiscal year ending November 30, 1905	$ 88,627.17
Receipts from sources other than State Fair	3,952.92
Receipts from State Fair 1905	$ 84,674.25
Premium and expense warrants issued account of 1905 State Fair	$ 62,450.97
Net profit for State Fair 1905	$ 22,223.28
Total receipts for the year	$ 88,627,17

Total amount of premiums and expenses, including permanent improvements	$ 78,447.87	
Warrants issued and unpaid	185.92	
Warrants of 1905 issue paid	$ 78,261.95	
Warrants of previous years paid	46.11	
Total amount of warrants paid 1905	$ 78,308.06	
Net increase of cash in treasury over December 1, 1904		$ 10,319.11
Cash in treasury December 1, 1904		$ 29,657.23
Total amount of cash balance in treasury November 30, 1905		$ 39,979.34
Premiums paid 1905	$ 28,730.89	
Premiums paid 1904	24,622.68	
Increase 1905 over 1904	$ 4,108.21	
Ticket sales 1905		$ 62,172.05
Ticket sales 1904		48,543.65
Increase 1905 over 1904		$ 13,628.40

Money expended for improvements on the State Fair Grounds in the last six years.

Appropriations from State:		
1902, for Stock Pavilion	$ 37,000.00	
1904, for Agricultural, Horticultural and Dairy Bldg	47,000.00	$ 84,000.00
From surplus available after paying all expenses and premiums each year;		
For 1900	$ 8,115.59	
For 1901	13,378.73	
For 1902	26,457.12	
For 1903	17,855.77	
For 1904	12,641.11	
For 1905	11,963.09	90,441.41
Total in six years for permanent improvements		$ 174,411.41

Amount paid for premiums for the last six years:

Fair of 1900	$ 18,547.32
Fair of 1901	19,205.83
Fair of 1902	21,736.31
Fair of 1903	23,813.13
Fair of 1904	24,691.68
Fair of 1905	28,730.89
Total for six years	$ 136,723.16

EXPENSE WARRANTS ISSUED IN 1905.

Date.	To Whom.	Warrant No.	Amount
December 1	Modern Steel Structural Co. balance on contract	4323	$ 63 29
December 1	Modern Steel Structural Co. balance on contract	4324	6.71
December 3	J. E. Simpson, expenses to Chicago	4325	20.65
December 14	A. J. Lovejoy, expenses attending annual meeting	4326	27.48
December 15	Fred Hethershaw, material and work on booth	4327	13.25
December 15	Fred Hethershaw, supt. mature corn show	4328	10.50
December 16	W. W. Morrow, December Board meeting	4329	32.20
December 16	C. E. Cameron, December Board meeting	4330	38.00
December 16	R. S. Johnston, December Board meeting	4331	39.80
December 16	C. W. Phillips, December Board meeting	4332	24.00
December 16	W. C. Brown, December Board meeting	4333	34 20
December 16	R. T. St. John, December Board meeting	4334	43.00
December 16	S. B. Packard, December Board meeting	4335	29.80
December 16	T. C. Legoe, December Board meeting	4336	34.00
December 16	M. J. Wragg, December Board meeting	4337	25.60
December 16	John Ledgerwood, December Board meeting	4338	32.40
December 16	M. McDonald, December Board meeting	4339	30.70
December 16	J. W. Wadsworth, December Board meeting	4340	24.30
December 16	O. A. Olson, December Board meeting	4341	12.00
December 16	H. L. Pike, December Board meeting	4342	44.00
December 16	W. W. Morrow, Executive Com. exp. to Chicago	4343	25.40
December 16	C. E. Cameron, Executive Com. exp. to St. Louis	4344	60.40
December 16	M. J. Wragg, itemized bill	4345	136.25
December 17	L. J. Clute, itemized bill	4346	22.34
December 17	W. C. Edinger, framing picture	4347	4.50
December 17	Iowa Telephone Co., telephone charges	4348	.55
December 17	A. C. Morrison & Co., insurance	4349	1.00
December 17	T. W. Purcell	4350	15.00
December 17	H. E. Talbott, veterinary work	4351	1.50
December 17	Western Union Telegraph Co., telegrams	4352	1.59
December 17	Wilcox, Howell & Hopkins, insurance	4353	187.50
December 17	Mutual Telephone Co., telephone rental	4354	17.50
December 17	R. L. Polk & Co., city directory	4355	5.00
December 17	J. H. Queal & Co., lumber, etc	4356	44 60
December 17	J. T. Fredregill, brick	4357	12 00
December 17	O'Dea Hardware Co., hardware	4358	26.12
December 17	Ben Woolgar, horse shoeing	4359	40.25
December 17	Mathews & Woolgar, itemized bill	4360	10.90
December 17	T. H. McBride, itemized bill	4361	1.00
December 17	J. E. Kelley, gate keeper, 1904	4362	2.50
December 17	Wm. Lamb, police duty, fair 1904	4363	2.50
December 17	C. O. Garrett, work on agr'l exhibit, St. Louis	4364	12.00
December 17	Tri-City Electric Co., itemized bill	4365	12.96
December 17	Postal Telegraph Co., telegrams	4366	.85
December 23	P. G. Holden, expenses annual meeting	4367	24.53
December 24	L. H. Kerrick, expenses annual meeting	4368	37.65
December 31	Jas. H. Deemer, December salary	4369	75.00
December 31	Jas. H. Deemer, pay roll	4370	102.30
January 20	W. C. Brown, special committee work	4371	22.20
February 1	Jas. H. Deemer, pay roll	4372	81.40
February 1	Jas. H. Deemer, January salary	4373	75.00
February 1	W. C. Brown, special committee work	4374	22.20
February 2	W. W. Morrow, Executive Committee meeting	4375	24.20
February 2	C. E. Cameron, Executive Committee meeting	4376	44.00
February 3	J. C. Simpson, itemized bill	4377	18.75
February 6	F. J. Ross, manuscript	4378	10.00
February 6	Chicago Daily Drovers Journal, subscript	4379	4.00
February 6	Chas. A. Laurence, sub. railway guide	4380	2.00
February 6	J. H. Welch Prtg. Co. envelopes	4381	24 75
February 6	Savery Hotel Co., itemized bill	4382	12.50
February 6	Wilcox, Howell & Hopkins, insurance	4383	109.38
February 6	L. G. Clute, itemized bill	4384	5.00
February 6	S. Joseph & Sons, silver cup	4385	35.00
February 6	Blaise & Blaise, reporting annual meeting	4386	19.90
February 6	Hawkeye Press Clipping Co., press clippings	4387	20.00

EXPENSE WARRANTS ISSUED IN 1905—CONTINUED.

Date.	To Whom.	Warrant No.	Amount
February 6	Buck Bros, paint	4388	$ 3.75
February 6	Glenwood Coal Co., coal	4389	2.12
February 6	J. E. Graff, itemized bill	4390	7.30
February 6	Baker-Trisler Co., stencil paper	4391	2.22
February 6	Register & Leader, job printing	4392	3.50
February 6	Howard Tedford, binding awards	4393	2.00
February 6	Mutual Terminal Co., telephone tolls	4394	3.60
February 6	Mutual Telephone Co., telephone rental	4395	17.50
February 17	John McKay, postmaster, stamps	4396	50.00
February 18	Jas. H. Deemer, pay roll	4397	101.75
February 18	W. C. Brown, special comm. work	4398	12.00
February 28	Jas. H. Deemer, February salary	4399	75.00
March 3	W. W. Morrow, executive comm. meeting	4400	24.20
March 3	C. E. Cameron, executive comm	4401	40.00
March 4	J. C. Simpson, itemized bill of expense	4402	44.19
March 13	Jas. H. Deemer, pay roll	4403	128.85
March 17	Dr. J. C. Rockafellow, services to boy injured at fair of 1904	4404	89.00
March 17	Mercy Hospital, exp. of boy injured at fair of 1904	4405	46.00
March 18	W. W. Morrow, special comm. work	4406	20.20
March 18	W. C. Brown, special comm. work	4407	22.20
March 25	D. M. Daily News, subscription	4408	3.65
March 25	A. L. Ames, exp. attending agr'l. convention	4409	11.30
March 25	Adams Express Co., express charges	4410	.85
March 25	U. S. Express Co., express charges	4411	6.95
March 25	American Express Co., express charges	4412	1.20
March 25	Savery Hotel Co., itemized bill	4413	1.50
March 25	Geo. A. Miller Ptg Co., printing cards, etc	4414	36.50
March 25	Mutual Terminal Tel. Co., toll charges	4415	.70
March 25	S. B. Packard, special comm. work	4416	9.80
March 25	Iowa Ptg Co., envelopes	4417	2.50
March 25	Iowa Lithographing Co., 15M letter heads	4418	51.25
March 25	Dempster Mfg. Co., supplies	4419	40.37
March 25	Western Union Tel. Co., telegrams	4420	2.58
March 25	Register & Leader, printing	4421	12.50
March 25	Star Engraving Co., zinc engraving	4422	5.00
March 25	O'Dea Hardware Co., supplies	4423	14 75
March 25	Billboard Pub. Co., sub. and advertising	4424	8.00
March 25	J. A. Backman, ventilators	4425	231.00
March 25	G. W. Deitz, lime	4426	.44
March 27	J. H. Deemer, pay roll	4427	242.71
April 1	Billboard Pub Co., advertising	4428	1 00
April 1	L. E. Simpson, printing speed program	4429	20.00
April 1	Jas H. Deemer, salary	4430	75.00
April 6	C. E. Cameron, executive comm. meeting	4431	31 00
April 6	W. W. Morrow, executive comm. meeting	4432	28.20
April 10	Jas. H. Deemer, pay roll	4433	266.67
April 10	Wabash Railway Co., frt. on car from St. Louis	4434	73.80
April 10	H. H. Simpson, drawing plans priv. dept	4435	35.00
April 15	C. R. I. & P. Ry. Co., frt. on straw from Menlo	4436	8.73
April 18	W. C. Brown, special comm. work	4437	22.20
April 18	F. M. Barnes, payment on 1905 contract	4438	100.00
April 24	Jas. H. Deemer, pay roll	4439	333.18
April 26	J. C. Simpson, exp. to St. Louis	4440	15.60
April 26	C. E. Cameron, exp. to St. Louis	4441	40.75
April 27	D. M. Union Ry. Co., frt. on garbage cans	4442	14.40
April 29	Jas. H. Deemer, salary	4443	75.00
April 29	Elsie Colton, clerical services	4444	55.00
May 5	Adams Express Co., express charges	4445	.73
May 5	Iowa Telephone Co, toll charges	4446	3.90
May 5	Baker Trisler Co., office supplies	4447	6.77
May 5	Dempster Mfg. Co., office supplies	4448	.88
May 5	Langan Bros., itemized bill	4449	.50
May 5	American Exp. Co., express charges	4450	82
May 5	Geo. A. Herrington, Horseman's Directory	4451	5.50
May 5	Lord & Woodard, itemized bill	4452	28.56
May 5	Western Union Tel. Co., telegrams	4453	2.50
May 5	Daily Capital, subscription	4454	1.50
May 5	U. S. Express Co., express charges	4455	2.90
May 5	Wheeler Lumber Co., lumber	4456	15.40
May 5	D. M. Fuel & Lime Co., cement	4457	185.00
May 5	Wells Fargo Express Co., express charges	4458	1.11
May 5	Chicago House Wrecking Co., cans	4459	70.64
May 5	Globe Mchy. & Supply Co., packing	4460	1.96
May 5	W. A. Henry, book	4461	1.50

EXPENSE WARRANTS ISSUED IN 1905—CONTINUED.

Date.	To Whom.	Warrant No.	Amount
May 5	Standard Glass & Paint Co., oil and lead	4462	$ 90.44
May 5	American Steel & Wire Co., fencing	4463	222.40
May 5	Pacific Express Co., express charges	4464	2.95
May 5	C. & G. W. Ry. Co., frt. on fencing	4465	36.92
May 5	The Horseman Pub. Co., adv. speed program	4466	30.60
May 5	Mutual Terminal Tel. Co., toll charges	4467	25
May 5	American Trotting Reg. Co., year book	4468	4.00
May 5	Iowa Telephone Co., toll charges	4469	1.50
May 8	Jas. H. Deemer, pay roll	4470	304.05
May 10	C. E. Cameron, executive committee meeting	4471	30.00
May 10	W. W. Morrow, executive committee meeting	4472	24.20
May 10	O. A. Olson, special committee work	4473	27.60
May 22	J. H. Deemer, pay roll	4474	1.00
May 22	J. H. Deemer, pay roll	4475	343.42
May 22	J. H. Deemer, hay, straw and grain for forage dept.	4476	283.76
May 27	C. R. I. & P. Ry. Co. freight on St. Louis goods	4477	45.46
May 29	J. C. Simpson, expenses trip to Chicago	4478	27.30
May 31	Jas. H. Deemer, salary	4479	75.00
May 31	Elsie Colton, clerical services	4480	55.00
June 3	John Wilson, hay for forage dept	4481	94.05
June 3	Chicago House Wrecking Co., St. Louis goods	4482	1,274.00
June 5	John McKay, postmaster, postage	4483	50.00
June 6	Geo. A. Miller Ptg. Co., 5M entry cards	4484	24.75
June 6	Horse Review Co., advertising	4485	47.61
June 6	Star Engraving Co., cut for year book	4486	54
June 6	Western Union Telegraph Co., telegrams	4487	5.74
June 6	American Express Co., express charges	4488	35
June 6	Savery Hotel Co., itemized bill	4489	3.00
June 6	Western Horseman, advertising	4490	19.50
June 6	Wragg Nursery Co., trees and shrubs	4491	115.15
June 6	Wilcox, Howell & Hopkins, insurance	4492	180.00
June 6	Mutual Telephone Co., telephone rental	4493	17.50
June 6	U. S. Express Co., express charges	4494	28
June 6	Mutual Telephone Co., toll charges	4495	80
June 6	Hawkeye Press Clipping, press clippings	4496	20.00
June 9	John McKay, postmaster, postage	4497	18.00
June 9	John McKay, postmaster, postage	4498	22.00
June 9	John McKay, postmaster, stamps	4499	50.00
June 10	W. W. Morrow, executive committee meeting	4500	24.20
June 10	C. E. Cameron, executive committee meeting	4501	26.00
June 10	R. T. St. John, special committee work	4502	31.50
June 10	Jas. H. Deemer, pay roll	4503	340.94
June 13	Matt Parrott & Sons, advertising	4504	99.96
June 14	John McKay, postmaster, postage	4505	62.00
June 16	R. S. Johnston, special committee work	4506	27.80
June 16	W. C. Brown, special committee work	4507	22.20
June 19	Harter-Christie Co. insurance	4508	120.00
June 19	D. M Rubber Stamp Works, stamps	4509	1.35
June 22	Jas. H. Deemer, pay roll	4510	352.92
June 22	C, R. I. & P. Ry. Co, advance charges car. from St. Louis	4511	15 00
June 23	John McKay, Sr. P. M. paid postage	4512	20.00
June 23	Sherwin-Williams Paint Co., paint for F. G.	4513	58 80
June 26	John McKay, Sr. P. M., postage	4514	40 00
June 29	C. R. I. & P. Ry. Co., frt. on hay	4515	11 64
June 29	John McKay, Sr P. M. postage	4516	76 00
June 29	E. VanHorn, oats for forage dept	4517	46 32
June 30	C. E Cameron, executive comm. meeting	4518	30 00
June 30	W. W. Morrow, executive comm. meeting	4519	24.20
June 30	J. C. Simpson, pay roll sec'ys office	4520	72 25
July 1	Jas. H. Deemer, salary	4521	75 00
July 3	Jas. H. Deemer, pay roll	4522	327.58
July 3	Jas H. Deemer, corn for forage dept	4523	24.70
July 5	C. & N. W. Ry. Co. frt on paint	4524	2 81
July 6	S Kirby & Co., hay for fair grounds	4525	112.94
July 6	American Press Co , printing	4526	82 25
July 7	J. C Simpson, advertising expenses	4527	5 75
July 10	T. W. Purcell Ptg. Co., printing premium list	4528	668.00
July 10	Dr C C Shope, services attending Harry Hatters	4529	18 50
July 11	Merchants Transfer Co , frt and cartage	4530	25.61
July 11	Grant Park Green House, flowers for F. G	4531	22 41
July 13	John McKay, Sr. P. M postage	4532	50 00
July 17	Wm. Dykeman, advertising	4533	40 00
July 17	Jas H. Deemer, pay roll	4534	364 91

EXPENSE WARRANTS ISSUED IN 1905--CONTINUED.

Date.	To Whom.	Warrant No.	Amount
July 20	Iowa Pub. Co,, hangers	4535	$ 250 00
July 20	Matt Parrott & Sons, fibre signs	4536	17 64
July 20	John McKay, Sr. P. M , postage.	4537	50 00
July 22	Globe Ticket Co , tickets	4538	118 75
July 24.	J. C. Simpson, advertising acct	4539	75 00
July 28	American Trotting Ass'n, annual dues	4540	75.00
July 28	Adams Express Co., express charges	4541	3 10
July 28	American Express Co , express charges	4542	1 65
July 28	Brown & Bigelow, horse covers	4543	114 35
July 28	Byrkit Bros , printing	4544	117 00
July 28	Baker-Trisler Co , office supplies	4545	70
July 28	D M. City Ry Co , turnstiles	4546	225 00
July 28	D. M Tank Co., wagon tank	4547	16 09
July 28	D. M. Fuel & Lime Co , lime	4548	3 06
July 28	Forest City Summit, envelopes	4549	40.09
July 28	Gray Lithographing Co advertising matter	4550	247.51
July 28	Glenwood Coal Co , coal and cinders	4551	18.50
July 28.	Hennegan & Co , adv. hangers	4552	20.00
July 28	Iowa Pipe & Tile Co , sewer pipe	4553	2 56
	Void	4554	0.00
July 28	Chas. Koenigsberger, supplies itemized	4555	9 60
July 28	Kindlespire & Hannaway, views	4556	16.30
July 28	Miller Prtg Co , printing	4557	18.50
July 28	Mutual Ter. Tel. Co , toll charges	4558	60
July 28	Mutual Telphone Co., phone rent	4559	17 50
July 28.	Star Engraving Co , cuts	4560	28 85
July 28	Sherwin-Williams Co., paint	4661	58.80
July 28	A. A. Smith Ptg. Co., printing	4562	11 50
July 28	U. S. Express Co. express charges	4563	12 45
July 28	Wells-Fargo Express Co., express charges	4564	2 60
July 28	Western Union Tel Co , telegrams	4565	5 18
July 28	H. L. Wegstem, advertising	4566	2 00
July 28	Whitmer & Kauffman, insurance	4567	150.00
July 28	White Line Transfer Co , dray and cartage	4568	7 45
July 29	A. A. Smith Ptg Co , printing	4569	5 00
July 31	J. C. Simpson, Secretary, pay roll	4570	95 75
July 31	Jas. H. Deemer, pay roll	4571	425 40
August 2	E. W. Smith & Co., keys for turnstiles	4572	7 00
August 4	Jas. H. Deemer, salary	4573	75 00
August 5	C. E. Cameron, executive committee meeting	4574	40 00
August 5	W W. Morrow, executive committee meeting	4575	24 20
August 5	S. B. Packard, special committee meeting	4576	17 80
August 7	A. B. Curry, oats for F. G	4577	147 45
August 9	Homestead Co., advertising	4578	268 59
August 9	H. H. Simpson, advertising	4579	62 80
August 9	W. C. Brown, advertising	4580	166.70
August 14.	A. W. Deets, advertising	4581	66 50
August 14	Jas. H. Deemer, pay roll	4582	694 40
August 14	J. S. Simpson, Secretary, advertising	4583	15 00
August 14	John McKay, Sr. P. M. stamps	4584	50 00
August 15	Goldberg & Rissen, straw	4585	45.77
August 15	Register & Leader Co., printing	4586	98 75
August 16	C. R. I. & P. Ry. Co., freight	4587	21 68
August 17	Chas. Orris, advertising	4588	57.00
August 22	John Wilson, forage department, hay	4589	152 88
August 22	American Press Co., itemized bill.	4590	27.10
August 22	S. W. Wilson, settees for F. G.	4591	33 00
August 23	A A. Smith Ptg Co., concert programs	4592	22 00
August 24	Chas. Orris, advertising	4593	27 50
August 25	J. W. O'Donnell, payment on night show.	4594	500 00
August 25	Chas. Weitz' Sons, Grand ave. entrance & band st'd	4595	1050 00
August 26	Geo. A. Miller Ptg. Co., payment on acct	4596	200 00
August 30	J. W. O'Donnell, second payment on night show	4597	425 00
August 30	Jas. E Shelley, special races, U. S. Cav	4598	90 00
August 31	W. S. Russell, services poultry judge	4599	45 00
August 31	F. M. Barnes, attractions	4600	420 00
August 31	A. Liberatti, Liberatti's Concert Band	4601	100.00
August 31	F. H. Scribner, judging dairy cattle	4602	69 41
August 31	J. W. O'Donnell, payment on night show	4603	600.00
August 31	F. M. Barnes, attractions	4604	700 00
September 1	J. W. O'Donnell, night show	4605	750.00
September 1	A. Liberatti, second payment on band	4606	1775 00
September 1	Lem H. Wiley, Indian band	4607	700 00
September 1	O. J. Mooers, exhibition of high school horse	4608	75 00

EXPENSE WARRANTS ISSUED IN 1905—CONTINUED.

Date.	To Whom.	Warrant No.	Amount
September 1.	Beth P. Hosmer, orchestra in stock pavilion	4609	$ 100 00
September 1.	J. W. O'Donnell, night show	4610	500.00
September 1	J. W. O'Donnell, night show	4611	605 00
September 1	R. S. Johnston, pay roll swine department	4612	94 00
September 1.	W. C. Brown, pay roll privilege department	4613	140 16
September 1.	C. W. Phillips, pay roll ticket department	4614	194 35
September 1	D. F. Sheehan, pay roll agricultural department	4615	282 45
September 1	T. C. Legoe, pay roll art department	4616	392.85
	Void	4617	000 00
September 1	M. J. Wragg, pay roll horticultural department	4618	160.00
September 1.	G. D. Ellyson, pay roll treasurer's department	4619	688.30
September 1.	H. R. Wright, pay roll dairy department	4620	216.10
	Void	4621	000.00
September 1.	H. L. Pike, pay roll sheep and poultry departments	4622	153.05
September 1.	C. S. Relyea, pay roll press bureau	4623	153.00
September 1.	C. E. Cameron, pay roll speed department	4624	213.60
September 1.	T. C. Bell, judge horse department	4625	100.00
September 1.	Frank C. Byers, services horse department	4626	10.00
September 1.	W. A. Dobson, judging horse department	4627	50.00
September 1.	R. B. Ogilvie, judging horse department	4628	100.00
September 1.	W. J. Kennedy, judging horse department	4629	50.00
September 1.	J. C. Simpson, pay roll forage department	4630	293.75
September 1.	W. R. Wilmot, payment on relay race	4631	23.25
September 1.	W. J. Kennedy, judging cattle department	4632	40 00
September 1.	C Larson, cattle department	4633	18 30
September 1.	Jas. H. Deemer, pay roll	4634	102 70
September 1.	J. C. Simpson, secretary, pay roll	4635	405.25
September 1.	Wayne Dinsmore, cattle department	4636	37.50
September 1.	E. T. Robbins, cattle department	4637	13.00
September 1.	E. M. Wentworth, cattle department	4638	6.50
September 1.	Floyd Turk, cattle department	4639	10.00
September 1.	W. R. Moninger, cattle department	4640	52 75
September 1.	C. F. Curtiss, judging cattle department	4641	40 00
September 1.	A. A. Armstrong, cattle department	4642	69.40
September 1.	W. R. Moninger, cattle department	4643	40 15
September 1.	S. B. Packard, pay roll cattle department	4644	1.00
September 1.	Donald Hill, pay roll police department	4645	1479.25
September 1.	C. H. Turk, pay roll machinery department	4646	110 35
September 1.	M. A. Gammill, machinery department	4647	52.50
September 1.	O. A. Olson, pay roll gate department	4648	900 18
September 1.	F. M. Barnes, payment on attractions	4649	250 00
September 1.	Wm. Moore, attraction	4650	180.00
September 1.	C. M. Akes, assistant marshal	4651	30.00
September 1.	T. J. Hudson, assistant marshal	4652	30.00
September 1.	Jas. E. Shelley, special races U. S. Cav	4753	95.00
September 1.	Jas. H. Deemer, salary	4954	75.00
Septembor 1.	W. W. Morrow, August board meeting	4655	84.20
September 1.	C. E. Cameron, August board meeting	4656	78.00
September 1.	J. C. Simpson. board at fair ground	4657	25.00
September 1.	R. S. Johnston, August board meeting	4658	87.80
September 1.	C. W. Phillips, August board meeting	4659	80.00
September 2.	W. C. Brown, August board meeting	4660	136.20
September 2.	S. B. Packard, August board meeting	4661	73.80
September 2.	O. A Olson, additional pay roll	4662	23.25
September 2.	T. C. Legoe, August board meeting	4663	90 00
September 2.	M. J. Wragg, August board meeting	4664	81.60
September 2.	H. L. Pike, August board meeting	4665	96 00
September 2.	W. W. Morrow, Executive committee meeting	4666	16 20
September 2.	O. A. Olson, August board meeting	4667	91 50
September 2.	John Ledgerwood, August board meeting	4668	100 70
September 2.	M. McDonald, August board meeting	4669	82 50
September 2.	Mrs. J. B. Essex, salary deceased policeman	4670	20 00
September 2.	W. R. Wilmot, payment on relay race	4671	500 00
September 2.	W. R, Wilmot, payment on relay race	4672	453 50
September 2.	R. Waller, assistant marshal	4673	30.00
September 2.	T. C. Legoe, additional pay roll	4674	12.00
September 2.	Donald Hill, Police department, additional payroll	4675	74.00
September 2.	W. H. Knight, Sec. Am. Trotting Ass'n, suspensions	4676	39 15
September 2.	W. R. Wilmot, payment on relay race	4677	26.00
September 2.	W. R. Wilmot, payment on relay race	4678	125.00
September 2.	W. R. Wilmot, payment on relay race	4679	25 00
September 2.	W. R. Wilmot, payment on relay race	4680	20 00
September 2.	W. R. Wilmot, payment on relay aace	4681	27 25
September 5.	W. R. Wilmot, payment on relay race	4682	800.00
September 5.	Ed Johnston, special detective work	4683	75.00

EXPENSE WARRANTS ISSUED IN 1905—CONTINUED.

Date.	To Whom.	Warrant No.	Amount
September 5	Jas. H. Deemer. pay roll, Aug. 12-Sept. 3	4684	$ 1339.08
September 5	Jas. H. Deemer, pay roll, caring for closets	4685	137.99
September 5	Jas. H. Deemer, pay roll. electric lights	4686	254.87
September 5	J. W. O'Donnell, payment on night show	4687	20.00
September 5.	Miss H. E. King, clerical work, press bureau	4688	3.25
September 5	Miss Jessie Shearer, clerical work, press bureau	4689	3.25
September 5.	C. S. Relyea, Superintendent press bureau	4690	4.75
September 5.	Louden Mchy. Co., litter carrier barn No 12	4691	55.00
September 5	F. M. Lail, judge swine department	4692	52.30
September 5	L. H. Roberts, judge swine department	4693	25.00
September 5	F. H. Luther, judge swine department	4694	40.80
September 5	W. Z. Swallow, judge swine department	4695	10.00
September 5	C. L. Latham, scavenger work	4696	50.00
September 6.	W. R. Ledgerwood, use of horse in E. L. work	4697	10.00
September 6	M. McDonald, pay roll, horse department	4698	35.75
September 6	G. D. Underwood, police duty	4699	2.50
September 9	W. W. Moore, bill posting	4700	284.36
September 9	Chas. Gray, judging in cattle department	4701	51 80
September 11	G. W. Farrell, straw	4702	83.45
September 11	C. C. Persons, straw	4703	62.55
September 12	C. G. Morrison, straw	4704	30.00
September 12	C. G. Morrison, straw	4705	89.55
September 13	C. & N. W. Ry. Co. freight on settees	4706	1 70
September 16	Mrs. S. L. Ryan, clerical work	4707	30.00
September 19	W. W. Morrow, pay roll	4708	16.00
September 21	W. W. Morrow, executive comm. meeting	4709	20.20
September 21	W. C. Brown, Auditing comm. meeting	4710	22.20
September 21	C. W. Phillips, Auditing comm. meeting	4711	12.00
September 21	John Ledgerwood, Auditing comm. meeting	4712	20.70
September 21	Smith & Wetherell, architects, Gr. Ave. entr	4713	70.00
September 21	J. H. Welch Ptg. Co. printing	4714	35.00
September 21	Geo. A. Miller Ptg. Co. printing	4715	231.09
September 21	Spirit of the West, advertising	4716	65.00
September 21	Wm. Burnett, fire team races	4717	300.00
September 21	G. H. Carter, advertising	4718	15.00
September 21	J. H. Queal & Co., lumber.	4719	2513.99
September 21	J. C. Simpson, itemized claims	4720	23,95
September 21	Wells-Fargo & Co., express charges	4721	5.09
September 21	U. S. Express Co., express charges	4722	12.95
September 21	American Express Co., express charges	4723	9.88
September 21	Adams Express Co., express charges	4724	9.11
September 21.	Standard Glass & Paint Co. paint, etc	4725	103.37
September 21	Register & Leader, advertising	4726	160.48
September 21.	Register & Leader, cuts	4727	14.50
September 21	D. M. Daily News, advertising	4728	150.00
September 21	D. M. Daily News, cuts, etc	4729	28.13
September 21	J. A. Backman, itemized statement	4730	65 69
September 21	Western Union Tel. Co., telegrams	4731	22.39
September 21	R. S. Johnston, special comm. work	4732	31.05
September 21	The Horse Review Co., advertising	4733	96.94
September 21	Baker-Trisler Co., itemized bills	4734	4.70
September 21	Merchants' Transfer Co. cartage and frt	4735	22.18
September 21	Midland Electric Co. Supplies	4736	5.05
September 21	C. O. Garrett, bal. on premiums	4737	18.00
September 21	Langan Bros. itemized statements	4738	48.18
September 21	Dempster Mfg. Co.. itemized statements	4739	6.57
September 21	D. M. Flour & Feed Co., Chop, etc	4740	100.63
September 21.	D. M. Fuel & Lime Co., itemized statement	4741	176.48
September 21	Iowa Pipe & Tile Co. itemized statement	4742	55.00
September 21	Globe Mchy & Supply Co. itemized statement	4743	29.78
September 21	O'Dea Hardware Co., hardware supplies.	4744	291.21
September 21	Centaur Wire Works, wire work	4745	86.50
September 21.	Mrs. G. M. Grimstead, bal. on premiums	4746	5.00
September 21.	Perry S. Carter, pump supplies, etc.	4747	21 20
September 21.	Wheeler Lumber Co., lumber	4748	13 69
September 21.	Miss Olive Clark, bal. on premiums	4749	1 00
September 21.	Leon Brown, advertising	4750	50 00
September 21.	D. M. Insurance Co., insurance on stock pavilion	4751	70 00
September 21.	P. D. Breeders Ass'n, refund on special prem	4752	11 00
September 21.	Harris-Emery Co., itemized bill	4753	25.03
September 21.	Brinsmaid & Co., fixtures for hort. dept	4754	95.25
September 21.	H. R Wright Supt dairy department	4755	48 00
September 21.	D. M. Daily Capital, advertising	4756	159 60
September 21.	Savery Hotel Co., exp. guests soldier's day	4757	24.30

EXPENSE WARRANTS ISSUED IN 1905—CONTINUED.

Date.	To Whom.	Warrant No:	Amount
September 21.	J W Patrick, livery soldiers day	4758	36 00
September 21.	London Club Stable, horse & buggy, gate dept	4759	21 00
September 21.	John T. Christie Co., insurance	4760	140 00
September 21.	Mail & Times, advertising	4761	25 00
September 21.	W M. Bomberger, refund of admission	4762	.50
September 21.	Witmer & Kauffman, insurance	4763	341 25
September 21.	Jas H Deemer, horse & buggy, ticket dept	4764	14 00
September 21.	Mid-West Pub. Co., advertising.	4765	10.00
September 21.	Hulsizer Co , tree palms	4766	74.00
September 21.	Wesley M. E Church, meals for Pella Band	4767	16 00
September 21.	Farmers Tribune, advertising	4768	113 40
September 21.	C S. Relyea, supplies for press bureau	4769	10 70
September 21.	Risser Music Co., rental of piano	4770	6 00
Sedtember 21.	Valley Jct Dining Hall, sandwiches for U S. Cav	4771	60 00
September 21.	T. C. Legoe, special comm work	4772	20 00
September 21.	C E Cameron, pay roll speed department	4773	2 00
September 21.	M. J. Wragg, itemized bill	4774	6 20
September 21.	W S. Parker, bill posting	4775	8 12
September 21.	Clarence Shivvers, advertising	4776	1 50
September 21.	D M Ice & Cold Storage Co , ice contract	4777	50 00
September 21.	Remington Typewriter Co , paper for press bureau	4778	19 20
September 21.	Smith Premier Typewriter Co., machines for press	4779	5.00
September 21.	D. M Bridge & Iron Co , gates at Grand Ave	4780	400.00
September 21.	Wallaces Farmer, advertising	4781	215 00
September 21.	Spirit of the West, advertising	4782	50 00
September 21.	Guiberson Costume Co., decorations	4783	200 00
September 21.	Standard Oil Co , oil	4784	5.04
September 21.	Younker Bros , itemized bill	4785	18 69
September 21.	Iowa Seed Co seed	4786	5 85
September 21.	D Fisher, sawdust	4787	30 65
September 21.	D M Tent & Awning Co , tents, etc	4788	43.85
September 31.	H. S Chase & Co , soap	4789	4 65
September 21.	Western Newspaper Union, paper	4790	15.36
September 21.	Arthur Frantzen & Co , electrical supplies	4791	21 08
September 21.	Sherwin-Williams Co., paint	4792	8.25
September 21.	Stoner Wall Paper Co signs	4793	35 50
September 21.	Chas. Koenigsberger, harness repairs, etc	4794	11 05
September 21.	F E. Tinkle, services ticket department	4795	3 75
September 21.	Miss Pauline Wieland, bal on premiums	4796	.50
September 21.	Seick Mfg. Co , rental of tents, etc	4797	230 60
September 21.	Chase & West, furniture for F. G	4798	198.00
September 21.	Geo. L Longshore, lumber.	4799	12.83
September 21.	Walter A Hunt, door and window stops.	4800	6 80
September 21.	Mark D Batchelder Co., advertising	4801	37 00
September 21.	T. D Doke, chief marshal	4802	50 00
September 21.	Wilcox, Howell & Hopkins, insurance	4803	366 80
September 21.	Shannon, Mott & Co , feed	4804	225.40
September 21.	J. E Graff, drugs for emergency hospital	4805	2 85
September 21.	C. W. Britton, police duty	4806	3.00
September 21.	Frank Stuart, police duty	4807	6 00
September 21.	W Harvey, refund of coop rent	4808	1 00
September 21.	J P. Jackson, special premium	4809	5 00
September 21.	B T. Wray & Sons, refund of pen rent	4810	2 00
September 21.	C C Prouty, bal on premiums	4811	20 00
September 21.	Miss Belle Hunt, bal on premiums.	4812	4 00
September 21.	Saunders Pub. Co., advertising.	4813	68.60
September 21.	C. E. McCray, signs	4814	3.50
September 21.	Iowa Telephone Co., toll charges	4815	11.95
September 21.	The Horseman Co , advertising	4816	35.50
Septemper 21.	Bishard Bros., printing	4817	2.50
September 21.	Mrs. Susan Tyler, rental of building on F. G	4818	15.00
September 21.	Ferguson Printing Co.. printing	4819	22.50
September 21.	D. M. Trunk Factory, advertising trunk	4820	11.50
September 21.	The Western Horseman, advertising	4821	53.50
September 21.	Byrkit Bros., printing	4822	21.25
September 21.	John M. Hatton, advertising	4823	8.00
September 21.	W. H. Mart, advertising	4824	2.00
September 21.	Helm Mfg. Co. swings for F. G	4825	30.00
September 21.	Glenwood Coal Co., coal	4826	133.20
September 25.	Mrs. J. H. McRostie, premiums	4827	15.33
September 25.	P. G. Holden, expense	4828	62.92
September 25.	T. J. Wornall, judging cattle	4829	53.75
September 26.	Jas. H. Deemer, pay roll	4830	276.27

EXPENSE WARRANTS ISSUED IN 1906—Continued.

Date.	To Whom.	Warrant No.	Amount
September 27.	Geo. H. White, premiums	4831	2.00
September 30.	Jas. H. Deemer, salary	4832	75.00
September 30.	Elsie Colton, clerical services	4833	60.00
September 30.	Florence Kieffer, bal. on premiums	4834	6.00
September 30.	Frantzen & Co., electrical supplies	4835	107.02
September 30.	T. E. McCurdy, custodian, iron pipe and flag cases	4836	220.00
October 9	J. C. Simpson, special comm. work	4837	85.74
October 13	C. W. Britton, hay	4838	85.57
October 14	R. S. Johnston, special comm. work	4839	68.20
October 20	Eben C. McLeod, expense joint agent	4840	17.00
October 23	Jas. H. Deemer, pay roll	4841	208.29
October 23	Mrs. L. Babcock, services police matron	4842	22.50
November 1	W. W. Morrow, special and executive comm. work	4843	36.20
November 1	C. E. Cameron, executive committee meeting	4844	26.00
November 1	Jas. H. Deemer, salary	4845	75.00
November 8	Lester M. Collins, premiums	4846	1.00
November 10	D. C. Glasser, refund on privilege contract	4847	20.00
November 20	T. F. Shannon, views of fair grounds	4848	49.75
November 20	Wheeler Lumber Co., itemized statement	4849	27.00
November 20	J. T. Fredrigill, gravel	4850	15 30
November 20	Merchants Transfer Co., drayage	4851	8.00
November 20	Hawkeye Transfer Co., itemized bill	4852	.55
November 20	Mutual Tel. Co., rentals	4853	17.50
November 20	Guinaud-Jones Co., silver cup	4854	38.00
November 20	G. H. Ragsdale & Co., diplomas	4855	47.50
November 20	J. H. Queal & Co., shingles	4856	68.00
November 20	Nichols Roofing Co., itemized bill	4857	25.00
November 20	O'Dea Hardware Co., itemized bill	4858	10.08
November 20	Globe Mchy. & Supply Co., itemized bill	4859	.07
November 20	Hawkeye Press Clipping Bureau, clippings.	4860	16.00
November 20	Western Union Tel. Co., telegrams	4861	3.78
November 20	Mutual Telephone Co., toll charges	4862	.90
November 20	Louden Mchy. Co., door hangers	4863	20.40
November 20	U. S. Express Co., express charges	4864	.65
November 20	Glenwood Coal Co., coal	4865	10.15
November 20	Holmes-Irving Co., medal and silver cups	4866	293.00
November 20	S. Josephs & Sons, silver cup	4867	60.00
November 30	Jas. H. Deemer, salary	4868	75.00
November 30	Elsie Colton, clerical services	4869	30.00
November 30	Buck Bros. Co., itemized bill	4870	15.25
	Total expense warrants issued 1905		$49,716.98

The Committee on Credentials reported as follows; and on motion of Geo. H. Van Houten the report was adopted and the delegates named therein entitled to a seat in the convention.

REPORT OF COMMITTEE ON CREDENTIALS.

Delegates to the Agricultural Convention, 1905.

Adair County Agricultural Society—J. M. Wilson, Menlo.

Adams County Agricultural Society—W. J. Drennan, Corning.

Bremer County—E. M. Reeves, Waverly.

Buena Vista County Agricultural Society—C. E. Cameron, Alta.

Black Hawk County Agricultural Society—B. L. Manwell, La Porte City.

Cass County Fair Association—E. F. Berg, Atlantic.

Cass County Fair Association—Massena District—John Holste, Massena.

Cedar County—Ebenezer Fogg, West Liberty.

Cerro Gordo County—W. G. Burnap, Mason City.

Clayton County Agricultural Society—Strawberry Point District—J. G. Hempel, Elkader.

Clayton County—Elkader Fair Association—J. G. Hempel, Elkader.

Clarke County—J. H. Jamison, Osceola.

Crawford County—I. J. Gibson, Denison.

Dallas County—Edward Vial, Adel.

Davis County Agricultural Society—J. C. Brouhard, Bloomfield.

Decatur County—C. W. Hoffman, Leon.

Dubuque County—H. C. Bumgartner, Dubuque.

Fayette County Agricultural Society—H. P. Hancock, West Union.

Franklin County Agricultural Society—T .W. Purcell, Hampton.

Floyd County Agricultural Society—John R. Waller, Rockford.

Greene County—Albert Head, Jefferson.

Guthrie County Agricultural Society—A. H. Grissell, Guthrie Center.

Hancock County Agricultural Society—F. B. Rogers, Britt.

Hardin County Agricultural Society—H. S. Martin, Eldora.

Harrison County Agricultural Society—C. H. Deur, Missouri Valley.

Henry County Agricultural Society—C. M. Clark, Mt. Pleasant.

Henry County Agricultural Society—Eastern Iowa District— Theodore Russell, Winfield.

Humboldt County Agricultural Society—L. C. Trauger, Livermore.

Jackson County Agricultural Society—C. W. Phillips, Maquoketa.

Jasper County Agricultural Society—C. W. Campbell, Newton.

Jefferson County Agricultural Society—J. P. Manatrey, Fairfield.

Keokuk County Agricultural Society—What Cheer District—T. C. Legoe, What Cheer.

Lee County Agricultural Society—Chris Haffner, Donnellson.

Louisa County Agricultural Society—Wapello District—R. S. Johnston, Columbus Junction.

Louisa County Agricultural Society—Columbus Junction District—R. S. Johnston, Columbus Junction.

Lucas County——D. C. Johnson, Chariton.

Lyon County—Geo. Monlux, Rock Rapids.

Marion County Agricultural Society—Lake Prairie District—T. D. Tice, Pella.

Marshall County Agricultural Society—Eden District—H. G. Buck, Rhodes.

Monona County—H. L. Pike, Whiting.

Montgomery County Agricultural Society—E. M. Murphy, Red Oak.

Muscatine County Agricultural Society—Union District—W. H. Shipman, West Liberty.

Muscatine County Agricultural Society—Wilton Junction District—W. H. Shipman, West Liberty.

Madison County Agricultural Society—T. J. Hudson, Winterset.

Mills County Agricultural Society—Shirley Gilliland, Glenwood.

Poweshiek County Agricultural Society—Grinnell Central—S. Jacob, Grinnell.

Polk County—Lew Burnett, Des Moines.

Sac County—Z. Fuller, Sac City.

Scott County—Wesley Greene, Davenport.

Shelby County Agricultural Society—L. H. Pickard, Harlan.

Sioux County Agricultural Society—J. F. Morris, Ireton.

Taylor County—Geo. H. Van Houten, Lenox.

Union County Agricultural Society—Creston District—W. W. Morrow, Afton.

Warren County—J. A. Manson, Carlisle.

Washington County—D. J. Palmer, Washington.

Winnebago County Agricultural Society—J. A. Peters, Forest City.

Winneshiek County Agricultural Society—Thomas Graham, Decorah.

Wright County Agricultural Society—W. C. Brown, Clarion.

FARMERS' INSTITUTES.

Benton County—Fred McCulloch, Hartwick.

Bremer County—E. M. Reeves, Waverly.

Buena Vista County—S. R. Hines, Storm Lake.

Butler County—George Adair, Shell Rock.

Calhoun County—T. W. McCrary, Rockwell City.

Cherokee County—R. Warburton, Cherokee.

Clay County—J. S. Walker, Spencer.

Dallas County—M. J. Wragg, Waukee.

Franklin County—T. W. Purcell, Hampton.

Guthrie County—S. J. Reed, Guthrie Center.

Hancock County—F. J. Oxley, Corwith.
Hardin County—J. B. Parmalee, Iowa Falls.
Ida County—E. Edmundson, Ida Grove.
Jefferson County—J. P. Manatrey, Fairfield.
Keokuk County—W. S. Chany, Sigourney.
Kossuth County—M. D. L. Parsons, Irvington.
Mahaska County—T. B. White, Oskaloosa.
Marion County—H. Shivvers, Knoxville.
Mitchell County—D. F. Sheehan, Osage.
Monona County—R. W. Cassady, Whiting.
O'Brien County—Mrs. W. M. Hulbert, Primghar.
Page County—H. H. Hatcher, Shenandoah.
Polk County—Roy West, Bondurant.
Shelby County—C. W. Davies, Harlan.
Story County—C. W. Mills, Ames.
Tama County—Welcome Mowry, Clutier.
Union County—W. W. Morrow, Afton.
Winnebago County—Eugene Secor, Forest City.
Winneshiek County—W. N. Drake, Decorah.

SOCIETIES AND ASSOCIATIONS.

State Horticultural Society—P. F. Kinne, Storm Lake.
Improved Live Stock Breeders' Association—E. M. Wentworth, State Center.

STATE BOARD OF AGRICULTURE.

EX OFFICIO.

State Dairy Commissioner—H. R. Wright, Des Moines.
State Veterinarian—P. O. Koto, Forest City.

OFFICERS.

President—W. W. Morrow, Afton.
Vice-President—C. E. Cameron, Alta.
Secretary—John C. Simpson, Knoxville.
Treasurer—G. D. Ellyson, Des Moines.

DISTRICT MEMBERS.

First—R. S. Johnston, Columbus Junction.
Second—C. W. Phillips, Maquoketa.
Third —W. C. Brown, Clarion.
Fourth——R. T. St. John, Riceville.
Fifth—S. B. Packard, Marshalltown.
Sixth—T. C. Legoe, What Cheer.
Seventh—M. J. Wragg, Waukee.
Eighth—John Ledgerwood, Leon.
Ninth—M. McDonald, Bayard.
Tenth—O. A. Olson, Forest City.
Eleventh—H. L. Pike, Whiting.

O. A. Olson,
C. W. Hoffman,
Fred McCulloch,
Committee on Credentials.

The committee on Resolutions made the following report, and on motion of the Chairman the report was adopted:

REPORT OF COMMITTEE ON RESOLUTIONS.

Your Committee on Resolutions would most respectfully report the following:

We rejoice at the large attendance of the present meeting of this society and the unusual interest manifested in agriculture and its kindred interests; we are proud of the magnificent exhibit in corn, the finest, said to be, ever held in the State of Iowa, as well as the fine extensive exhibit of fruits; and the thanks of this convention are hereby extended to the officers of the State Board of Agriculture for their efforts in making the present meeting of unusual interest and success; we recognize that our State Agricultural College is doing a grand work, and has not only a national, but an international reputation, and it should receive the liberal and generous support of our legislature.

The State Fair is a reflex of the intelligence, thrift and progressiveness of the people of Iowa, and the efforts of its officers in keeping it in a clean, moral and healthy tone should receive the commendation of all of its patrons.

Whereas, The encouragement of good roads in Iowa is most desirable and of vast importance to all its citizens; therefore, be it

Resolved, That it is the sense of this society that the ensuing legislature pass some measure for the encouragement of the use of wagons with wide tires on public highways. Also that the legislature pass a law requiring township trustees to make reasonable compensation to the owner or occupants of the land abutting on highways for work expended upon such portions of the highway during the year, under the direction of the township trustees or road supervisors, and not to exceed fifty per cent of the road tax of such persons in any one year.

Resolved, That we recognize the great necessity for a pure food law in this State, and we most earnestly request the members of the ensuing legislature to cause a suitable food law to be enacted, prohibiting the adulteration and misbranding of all articles of food and drink for man and domestic animals.

Resolved, By the Iowa State Farmers' Institute and the Iowa State Board of Agriculture, That we very much regret to learn of the action of the commission merchants, through their respective live stock exchanges at different markets, providing for an advance in the commission charges for selling stock. The live stock industry at the present time is in no condition to bear an additional tax of any kind whatever, and it seems to us an especially inopportune time for our commission merchants to arbitrarily, and, so far as we can see, without good reason, advance their charges. In behalf of the farmers and feeders and live stock shippers of the State of Iowa, these Associations wish to enter a most vigorous protest against the proposed advance and to urge the different live stock exchanges to reconsider their action.

Resolved, That we regard the duty of Congress to be imperative in the revival in some form of the principles of reciprocal trade relation as enunciated in Section Four of the Dingley Act. That this is demanded as an act of good faith, and is a necessity for the agricultural interests, as well as for a large portion of the manufacturing interests of the country. We believe commerce to be an exchange of commodities. We believe that the doctrine enunciated by Mr. McKinley in his Buffalo speech is absolutely essential to the welfare of the country, and we demand that steps be taken at once to carry out the policy pledged by the Republican party in the Dingley Act to the country at large. We believe that the principles of Section Four of the Dingley Act if enacted into a law would constitute a maximum and minimum tariff, which should be put into force by the executive without further legislation, and we request our representation in Congress to act promptly before irretrievable damage is done in this direction, to the end that we may retain the markets that we now have for all agricultural products and extend the same throughout continental Europe.

All of which is most respectfully submitted.

H. P. Hancock.
J. F. Morris.
R. W. Cassady.
Committee on Resolutions.

The convention proceeded to the election of the following officers of the State Board of Agriculture for the terms of one year each, and for district members for the terms of two years each:

President,
Vice President.
Member from the First District,
Member from the Third District,
Member from the Fifth District,
Member from the Seventh District,
Member from the Ninth District,
Member from the Eleventh District,

ELECTION OF OFFICERS AND DIRECTORS.

Mr. C. W. Hoffman, of Decatur county, placed in nomination for president of the State Board of Agriculture, Hon. W. W. Morrow of Union county, to succeed himself. Mr. Legoe seconded the nomination and moved that the nomination be closed and the secretary be instructed to cast the entire vote of the convention for Mr. Morrow. Motion prevailed. The secretary so cast the vote and Mr. Morrow was declared elected President of the State Board of Agriculture for the ensuing year.

Mr. T. W. Purcell, of Franklin county, placed in nomination for vice-president Mr. C. E. Cameron, of Buena Vista county, to succeed himself, and moved it there were no others nominations that the secretary be instructed to cast the unanimous vote of the convention for Mr. Cameron. Motion prevailed. The secretary so cast the vote and Mr. Cameron was declared duly elected Vice-President of the State Board of Agriculture for the ensuing year.

Mr. D. J. Palmer, of Washington county, placed in nomination for member of the Board from the First District Mr. R. S. Johnston, of Louisa county, to succeed himself, and moved if there were no other nominations that the secretary be instructed to cast the entire vote of the convention for Mr. Johnston. The secretary so cast the vote and Mr. Johnston was declared duly elected member of the Board of Agriculture from the First District for a term of two years.

Mr. B. L. Manwell, of Black Hawk county, placed in nomination for member of the Board from the Third District Mr. W. C. Brown, of Wright county, to succeed himself, and moved if there were no other nominationes that the secretary be instructed to cast the unamimous vote of the convention for Mr. Brown. Motion prevailed. The secretary so cast the vote and Mr. Brown was declared duly elected a member of the State Board of Agriculture from the Third District for a term of two years.

Mr. Welcome Mowry, of Tama county, placed in nomination for member of the Board from the Fifth District Mr. S. B. Packard, of Marshall county, to succeed himself. Mr. R. T. St. John of Mitchell county, moved if there were no other nominations that the secretary be instructed to cast the unanimous vote of the convention for Mr. Packard. Motion prevailed. The secretary so cast the vote and Mr. Packard was declared duly elected member of the State Board of Agriculture from the Fifth District for a term of two years.

Mr. W. C.Burnap, of Cerro Gordo county, placed in nomination for member of the Board from the Seventh District Mr.

M. J. Wragg of Dallas county, to succeed himself, which motion was seconded by Mr. Elmer Reeves, of Bremer county. Judge W. H. McHenry, of Pork county, not being a delegate or having a voice on the floor, asked permission of the chairman to nominate a candidate. Permission being granted, Mr. McHenry nominated Mr. P. S. Kell, of Polk county, as a member of the Board of the Seventh District. Mr. E. M. Wentworth, of Story county, placed in nomination for a member of the Board from the Seventh District Mr. Chas. F. Curtiss, of Story county, which motion was seconded by Mr. Roy West of Polk county, and Mr. Mills of Story county.

The President named as tellers Mr. John Ledgerwood, of Decatur county, Mr. H. Shivvers, of Marion county, and Mr. W. H. Shipman, of Muscatine county. The roll was called by the secretary and the vote cast, and the tellers reported the result of the ballot as follows: Total number of votes cast one hundred and eight (108), of which Mr. M. J. Wragg received forty-three (43) votes, Mr. P. S. Kell received nine (9), and Mr. C. F. Curtis received fifty-six (56).) Mr. Chas. F. Curtiss, having received a majority of the votes cast, was declared by the President duly elected a member of the State Board of Agriculture from the Seventh District for a term of two years.

Mr. A. H. Grissell, of Guthrie county, placed in nomination for member of the Board from the Ninth District, Mr. M. McDonald of Guthrie county, to succeed himself, which nomination fas seconded by Mr. R. S. Johnston, of Louis county. Senator Shirley Gillilland of Mills county placed in nomination for member of the Board from the Ninth District, Mr. G. M. Hull, of Montgomery county, which nomination was seconded by Mr. H. P. Hancock of Fayette county.

The roll was called by the secretary, the vote cast, and the tellers reported the result of the ballot as follows: Total number of votes cast one hundred and three (103), of which Mr. McDonald received sixty-three (63) and Mr. Hull received forty (40). Mr. Gillilland moved that the election of Mr. McDonald be made unanimous. The president declared Mr. McDonald duly elected a member of the State Board of Agriculture from the Ninth District for a term of two years.

Mr. R. W. Cassady, of Monona county, placed in nomination for a member of the Board from the Eleventh District, Mr. H. L. Pike, of Monona county, to succeed himself. Mr. Edmundson of Ida county, seconded the nomination, and moved if there were no other nominations the secretary be instructed to cast the entire vote of the convention for Mr. Pike. Motion prevailed. The secretary so cast the vote and Mr. Pike was declared duly elected a member of the State Board of Agriculture from the Eleventh District for a term of two years.

There being no further business, on motion the convention adjourned.

J. C. SIMPSON,
Secretary.

MEETING OF THE STATE BOARD OF AGRICULTURE.

THURSDAY, DECEMBER, 14, 1905.

Board met at nine o'clock, A. M., Meeting called to order by the President and on roll call the following members were found to be present: Morrow, Cameron, Simpson, Johnston, Brown, Packard, St. John, Legoe, Curtiss, Lergerwood, McDonald, Pike, Olson and Ellyson.

Minutes of the last meeting were read and approved.

Mr. Packard moved that the oath of office be administered to the newly elected members. Hon. John Crockett, Clerk of the Supreme Court, was called in and administered the oath of office to Messrs. Morrow, Cameron, Johnston, Brown, Packard, Curtiss, McDonald and Pike.

The Board proceeded to the election of Secretary and Treasurer. Mr. Packard moved that J. C. Simpson be elected Secretary to succeed himself. Motion was seconded by Mr. Legoe, who further moved that the President be instructed to cast the vote of the entire Board for Mr. Simpson for Secretary. The vote was so cast, and the President declared J. C. Simpson elected Secretary for the ensuing year.

Mr. Ledgerwood placed in nomination for Treasurer Mr. G. D. Ellyson to succeed himself, and moved that the salary be fixed at $100.00, which motion was seconded and the President instructed to cast the vote of the Board for Mr. Ellyson. The vote was so cast and Mr. Ellyson was declared duly elected Treasurer of the State Board of Agriculture for the ensuing year.

The Secretary presented a bill of $40.00, filed by Mrs. Lucile Eichenlaub, of Ft. Dodge, Iowa, for the loss of a table cloth exhibit by Miss Carrie Newberry, which had been exhibited and lost at the last State Fair. Mr. Legoe moved that the bill be allowed, which motion was seconded by Mr. McDonald. Mr.

Cameron moved to amend by making the amount $25.00 instead of $40.00, which amendment was seconded by Mr. Packard, and on roll call the amendment prevailed.

Secretary presented a letter from Miss Margaret Getts of Cascade, Mont., regarding the award of a gold medal at the last State Fair for riding in Ladies Relay Race. No action was taken.

Secretary read the report of the Executive Committee making recommendations and reviewing the business which had been transacted by them during the past year, and on motion of Mr. Packard the report was received and placed on file for further consideration.

REPORT OF EXECUTIVE COMMITTEE.

To The Honorable Members of the State Board of Agricultural.

Gentlemen:—As your Executive Committee, we feel it our duty to make report to you on the work delegated to us at our meeting one year ago, and to bring to your attention some matters of importance which should have your careful consideration at this meeting.

.Your committee endeavored, in so far as possible, to carry out the instructions of the Board for the past year in the improvements and work at the Fair Grounds, and in arranging a program and selecting such attractions for the last State Fair that would meet with your approval. As shown by the Secretary's financial statement, about $12,000.00 was expended for improvements and repairs on the Fair Grounds the last year. As per resolution of the Board, passed at their last meeting during the Fair of 1904, all cinders that could be obtained, without too great an expense, were secured and placed on the streets. Three large ventilators were placed upon the agricultural building and a music balcony constructed in the interior, together with some minor improvements, such as tables and railings for the different departments therein. The forage barn was torn down and rebuilt near the south entrance, so that it would be more accessible to the stock barns. The balance of the high board fence along the front of the grounds was replaced by a seven foot woven wire fence, as was also the fence running east from the south gate to the corner near the old dairy building. As you are aware, when the agricultural, horticultural and dairy building was constructed, the old dairy building was assigned to the Privilege Department to be used as a dining hall. To this was added a kitchen and other changes enlarging the capacity about one-fourth. The art building was removed from in front of the womens' building and set in the angle at the southeast corner of the exposition building. At the suggestion of the Board, some landscape gardening was done and quite a large number of trees set out. Two additional rooms for hospital purposes were added to the womens' building, and quite a little painting was done on the building over the grounds. The entrance at the amphitheater was changed, registering turnstiles were put in, the front aisle in the west stand was widened and a new floor laid. The entrances at the street car station and Capital Avenue were also remodeled and turnstiles put in. Some curbing and guttering was done along the north side of Grand Avenue to better care for the water coming from off the hill, it being impossible to keep the streets from being torn up without this curb and gutter; the walk put down on the west side of Rock Island Avenue and to the womens' building. An addition was made to the Secretary's office, to afford a more central office for the President and a room for Board and committee meetings. Some additional hog pens were built, and the old poultry building enlarged and converted into a cattle barn with room for ninety-six head of cattle. Several stock barns were reshingled, and other improvements made to put them in shape for the Fair. An imposing entrance was constructed at Grand Avenue, and other improvements and repairs of a minor nature made, all of which go to make up the $12,000.00 which was expended for that purpose last year.

As to the work for the new year, we can only give you some idea of the amount of money which will be available for improvements and repairs and call your attention to the many improvements needed. In doing this we will give you a list, (to which should be added any others that may be suggested by the members of the Board), that will amount in the whole to more than double the funds that will be available. Presuming that you still desire to continue the emergency fund of $15,000.00, this amount will first have to be deducted from the cash on hand, as will also the sum of about $5,000.00 to pay the contingent expenses until the next Fair. This will leave a balance of about $20,000.00, in round numbers, available for improvements and other work. In the list submitted below you will notice one item of $8,100.00 for water supply. This is the estimate which the Secretary has on file from the Water Works Company of the cost of laying about 7,500 feet of six and eight inch mains, about fifteen or sixteen fire hydrants, and other work and material incidental to this. We believe that some fire protection should be provided, but believe this is a matter which should properly come by an appropriation from the State.

We call your attention to the matter of remodeling the exposition building. In our opinion it will be several years before a new building is erected, and some changes should be made which will make it a more modern exposition building. The need of another sanitary closet near the camp grounds northeast of the exposition building is very great and should be erected without further delay. Another cattle barn of about the capacity of the two large barns we now have is needed. The fence along the north and south side of the grounds should be rebuilt. About $3,000.00 should be appropriated for a miscellaneous improvement fund, to provide a fund for matters coming up during the season which we cannot foretell at this time. The question of more light should be considered, either by running in the city gas mains and using the gas for street lights and our own light for buildings and the night show, or increasing the capacity of the present lighting plant, or by an arrangement with the Des Moines Edison Light Company (if such an arrangement can be made) to put in a lead to the Fair Grounds which would be of sufficient capacity to about double our present number of lights.

Now as to what new buildings and improvements you will ask from the coming session of Legislature, that will be for you gentlemen to say. A new hog barn has been suggested, and we might say contemplated for two or three years. A building in which to exhibit the products of the Iowa factories is being urged by the Iowa Manufacturers Association. A larger and fire proof amphitheater has been suggested, as well as an appropriation sufficient to cover the expenses of the water supply for fire protection.

The matter of attractions should have your careful consideration, and whether or not you wish to continue the night show.

Another question which you will be called upon to decide is what dates you desire for the next Fair, and whether you wish to have the Fair extend over two weeks. This matter should be settled at this meeting, before our representative meets with the American Association of Fairs and Expositions at Chicago on the 20th of this month, at which time and place the several state fair dates will be arranged.

We believe that the rules in our premium list should be thoroughly revised and brought up to date before being published in the next premium list, and that a committee should be appointed for this purpose.

SCHEDULE OF PROPOSED IMPROVEMENTS FOR FAIR GROUNDS.

Remodeling Eposition Building by putting in cases, ceiling putting on drop siding, etc	$6,000.00
Water supply	8,100.00
Dining halls (to utilize lumber from amphitheater should new amphitheater be erected	5,000.00
Gas Mains	4,000.00
Miscellaneous improvements and repairs	3,000.00
Cattle barn	3,000.00
Sanitary closet	3,000.00
New fencing (an absolute necessity)	2,500.00
Lighting (if capacity of present plant is increased)	2,500.00
Walks	1,200.00
Curbing and guttering	1,000.00

Fire station	1,000.00
Telephone system	600.00
Sewers and drainage	500.00
Street improvement	600.00
Ice Box in Dairy Department	500.00
Expense of taking down amphitheater, if new one is erected	1,000.00
Booth in Dairy Department	300.00
Lowns seats	400.00
Landscape gardening	400.00
Total	$44,600.00

Respectfully submitted,

W. W. Morrow,
C. E. Cameron,
J. C. Simpson,
Executive Committee.

Mr. Johnston moved that G. C. Fuller be elected Assistant Secretary of the State Board of Agriculture to succeed himself. Motion prevailed, and Mr. Fuller was declared duly elected Assistant Secretary for the ensuing year.

Mr. Cameron moved that Mr. James H. Deemer be elected Superintendent of Grounds to succeed himself for the ensuing year, and that the salary be fixed at $900.00 per year, which motion prevailed and Mr. Deemer was declared duly elected Superintendent of Grounds for the ensuing year.

Mr. Cameron moved that a new department be created, to be called Department of Police Regulations, the Superintendent of which should have charge of all the marshals and police during the fair, which motion prevailed.

Board adjourned.

AFTERNOON SESSION.

Board met at 1:45 P. M., with all members present.

A committee of Des Moines business men appeared before the Board and had a hearing with reference to changing the time of holding the fair to a later date and holding a two weeks fair.

A committee representing the Iowa Manufacturers Association appeared before the Board and presented the matter of the necessity of a new Manufacturers Building on the Fair grounds.

Mr. Cameron moved that Mr. J. R. Sage, Director of the Iowa Weather and Crop Service be recommended to the Governor for reappointment at the expiration of his present term. Motion prevailed.

Mr. Packard moved that the assignment of Superintendents of Departments be referred to the Executive Committee. Motion prevailed.

The advisability of continuing the night show was discussed at length, and on motion of Mr. Legoe it was decided to be the unanimous opinion of the Board that a night show of some kind should be provided at the Fair of 1906.

Mr. Ledgerwood moved that the Board proceed to the election of four marshals, and that the salary for each be $35.00. Motion prevailed. Mr. C. M. Akes of Decatur county, Mr. T. D. Doke of Daivs county, Mr. John R. Wallace of Floyd county, Mr. Carl Shields of Union county and Mr. T. J. Hudson of Madison County were nominated. The President appointed as tellers Mr. Olson and Mr. Ledgerwood, and the Board proceeded to ballot, the four receiving the highest number of votes to be declared elected. The ballots were cast and counted, the vote being as follows: Hudson 13; Shields 13; Akes 12; Doke12; Walker 2. Messrs. Hudson, Shields, Akes and Doke, having received the highest number of votes, were declared elected marshals for the Fair of 1906.

On motion of Mr. McDonald, Mr. Donald Hill, of Buena Vista county, was elected Chief of Police for the Fair of 1906.

On motion the Board adjourned to meet at 9:30 A. M. Friday, December 15th.

MEETING OF THE STATE BOARD OF AGRICULTURE.

FRIDAY, DECEMBER, 15, 1905.

Board met at 9:30 A. M. pursuant to adjournment. Minutes of the meeting of Dec. 14th were read and approved. On roll call the following members were found to be present: Morrow, Cameron, Simpson, Johnston, Brown, St. John, Packard, Legoe, Ledgerwood, McDonald, Olson, Pike and Wright.

The bill of Mrs. Mary Watts, claiming damages sustained to dining hall and contents by reason of the removal of same by the Board on the Fair Grounds, was presented. Mr. Ledgerwood moved that the bill be rejected. Seconded by Mr. Brown. Motion carried.

The Executive Committee made the following report on the assignment of Superintendents.

Superintendent of tickets	C. W. Phillips
Superintendent of gates	O. A. Olson
Superintendent of privileges	W. C. Brown
Superintendent of grounds	Jas. H. Deemer
Superintendent of police regulations	M. McDonald
Superintendent of horses	C. F. Curtiss
Superintendent of speed	C. E. Cameron
Superintendent of cattle	S. B. Packard
Superintendent of swine	R. S. Johnston
Superintendent of sheep and poultry	H. L. Pike
Superintendent of machinery	John Ledgerwood
Superintendent of agriculture, pantry stores and apiary	R. T. St. John
Superintendent of dairy and dairy implements	H. R. Wright
Superintendent of horticulture	Elmer Reeves
Superintendent of floriculture	Wesley Greene
Superintendent of exposition building	T. C. Legoe

Mr. Johnston moved that the report be accepted. Seconded by Mr. Pike. Motion carried.

The Executive Committee made the following report on Standing Committees.

Executive Committee—W. W. Morrow, C. E. Cameron, J. C. Simpson.

Auditing Committee—John Ledgerwood, C. W. Phillips, W. C. Brown.

Committee on Resolutions—R. T. St. John, M. McDonald, T. C. Legoe.

Powers and Duties of Board—Governor Albert B. Cummins, W. W. Morrow, C. E. Cameron.

Adulteration of Foods, Seeds and Other Products—S. B. Packard, C. F. Curtiss, H. R. Wright.

Dairy Industries and Products, Including Fraudulent Imitations Thereof—H. R. Wright, O. A. Olson, T. C. Legoe.

Contagious Diseases Among Domestic Animals—P. O. Koto, R. S. Johnston, H. L. Pike.

Iowa Weather and Crop Service—J. R. Sage, Director.

The matter of increased lighting facilities at the Fair Grounds was discussed at length, and on motion of Mr. Legoe, it was referred to the Executive Committe for final decision.

Secretary presented a schedule, or estimate, for laying water mains on the Fair Grounds, and on motion of Mr. Legoe, the question of water supply was referred to the Executive Committee.

On motion of Mr. McDonald, seconded by Mr. Brown, fifteen thousand dollars ($15,000), of the cash in hands of the Treasurer on December 1st, 1905, was set aside as an emergency fund.

A committee of the East Des Moines Commercial League appeared before the Board and asked for the use of the Fair Grounds for the annual meeting of the Dunkard Church sometime during the month of June, 1907, and on motion the matter was left to the Executive Committee to make such arrangements as they thought best.

The question of what appropriation to ask from the Thirty-first General Assembly was discussed at great length. The urgent need of a hog barn, amphitheater, horse barn, manufacturers building and implement shed was urged by several members of the board. It was finally agreed, that, owing to the fact that the Thirty-second General Assembly would meet one year from this winter, it would not be wise to ask too great amount from the present General Assembly, as they would have only one-half the usual amount to appropriate for extraordinary purposes. This being the case, it was agreed that but one building should be asked for, and on motion of Mr. Packard, a vote was taken as to whether the Board should ask for an amphitheater or a hog barn. The Secretary called the roll and the vote stood as follows: For the amphitheater: Morrow, Cameron, Packard, Ledgerwood, McDonald, Olson, Pike and Wright; for the hog barn; Simpson, Johnston, Brown, St. John and Legoe. The majority of the Board having voted in favor of asking for an amphitheater at this session of the legislature, the Executive Committee was instructed to have plans and specifications prepared for a steel or concrete amphitheater, and to use their discretion for preference; also to prepare the necessary bill for introduction.

Mr. St. John moved that the Executive Committee be authororized to make necessary improvements on the Exposition Building, in a sum not to exceed six thousand dollars ($6,000). Motion prevailed.

Mr. Legoe moved that the Executive Committee be instructed to provide for the erection of a new cattle barn, at a cost not to exceed three thousand dollars ($3,000). Motion prevailed.

On motion of Mr. Packard, three thousand dollars ($3,000) was appropriated for miscellaneous improvements.

Mr. Wright moved that eight hundred dollars ($800) be appropriated for placing an ice box and other improvements in the Dairy Department of the Agricultural, Horticultural and Dairy Building. Motion prevailed.

Mr. Brown moved that three thousand dollars ($3,000), or so much thereof as may be necessary, be appropriated for improvements in the Swine Department. Motion prevailed.

Mr. St. John, Chairman of the Committee on Resolutions, submitted the following and moved its adoption, which motion prevailed:

RESOLUTION ON THE DEATH OF FORMER MEMBER OF STATE BOARD DANIEL SHEEHAN.

Whereas, The Supreme Master has called from labor to rest our friend and former colleague, Daniel Sheehan, who for many years was an honored member of the Iowa State Board of Agriculture, and who at one time was president of the Live Stock Breeders Association of Iowa, and was an active member of the Iowa State Dairy Association, and one of the pioneers in the creamery industry of this State, and a prominent Short Horn Breeder; therefore be it

Resolved, That while we deplore his loss we appreciate the services he has rendered to the Iowa State Fair, and the other prominent associations with which he was prominently connected and by these persents do perpetuate his memory by causing the same to be placed upon the records of this Department of State, and by causing a copy of same to be forwarded to his relatives.

R. T. St. John,
T. C. Legoe,
M. McDonald.
Committee on Resolutions.

Mr. Legoe moved that all money not heretofore appropriated be placed in the miscellaneous fund, to be expended under the direction of the Executive Committee. Motion seconded by Mr. Brown. Carried.

Mr. Olson moved that the revision of the rules in the premium list be left to the Executive Committee with power to act. Seconded by Mr. Brown. Motion carried.

Board adjourned until 1:30 P. M.

AFTERNOON SESSION.

Board met at 1:30 P. M., pursuant to adjournment, and on roll call the following members were found to be present: Morrow, Cameron, Simpson, Johnston, Phillips, Brown, St. John, Packard, and Wright.

The Executive Committee announced its decision to allow the use of the Fair Grounds for the Dunkard Church meeting in June, 1907, on the condition that the church pay all expenses for light, water, cleaning up the grounds, etc. Decision approved by the Board.

Mr. Legoe moved that twenty-five policemen be selected in the same way as the gate men, for the Gate Department, and that they report to Superintendent of States direct and be under his supervision during the Fair. Seconded by Mr. Packard. Motion carried.

Mr. Ledgerwood moved that each member of the Board appoint for the next fair three policemen, none of whom shall be over fifty years of age; and that the Secretary and Treasurer appoint five men, who shall be mounted police. Motion seconded and carried.

Mr. McDonald moved that the revision of the premiums and rules in the Horse Department delegated to the Secretary and the Superintendent of the department which motion was duly seconded and carried.

Mr. Packard moved the following revision in Department C, in general classes for Short Horns, Hereford, Aberdeen-Angus and Galloway cattle:

Strike out "bull calf under one year" and insert in lieu thereof:

Senior bull calf (dropped between Sept. 1, 1905, and Jan. 1, 1906)	$15	$10	$7	$5	$3	$2
Junior bull calf (dropped since Jan. 1, 1906)	$15	$10	$7	$5	$3	$2

Strike out "heifer calf under one year" and insert in lieu thereof:

Senior heifer calf (dropped between Sept. 1, 1905, and Jan. 1, 1906)	$15	$10	$7	$5	$3	$2
Junior heifer calf (dropped since Jan. 1, 1906)	$15	$10	$7	$5	$3	$2

Mr. Packard moved that the amendment be adopted. Seconded by Mr. Wright. Motion carried.

Mr. Packard moved that a class for Dutch Belted cattle be added in the dairy classes, and that the premiums be the same as offered in the Polled Durham class, amounting to four hundred and ten dollars ($410.00), same to be void if less than three herds are exhibited. Seconded by Mr. Wright. On roll call the members voted as follows:

Aye: Cameron, Johnston, Phillips, Packard, Legge, Ledgerwood, Olson, Pike and Wright. No: St. John, McDonald. Motion carried.

Mr. Packard moved that Class 32 for Grand Beef Herd be discontinued. Seconded by Mr. Johnston. Motion carried.

Mr. Packard moved that the Secretary be instructed to send the following reply to the Committee on Special Premiums of the Holstein-Friesian Association of America:

Mr. W. B. Barney, Chairman,
Hampton, Iowa.

Dear Sir:—

We, the State Board of Agriculture, decline to increase the premiums in the Holstein class of cattle in consideration of the fact that the financial condition of the Department does not warrant the increase.

The Board suggests that if you will add your $500.00 to our premiums that the same will be larger than the Wisconsin premiums with yours added last year.

Respectfully,
IOWA STATE BOARD OF AGRICULTURE.

which motion was seconded by Mr. McDonald, and carried:

Mr. Reeves, Superintendent of Horticulture, recommended the following changes in premiums in Department L, Horticulture:

Class 100, Premium No. 1072, to read as follows:				
No. 1072. Collection, not less than twenty varieties nor more than fifty		$25	$15	$10
Class 101, No. 1077. Collection, not less than twenty varieties nor more than fifty		$25	$15	$10
Class 102, No. 1082. Collection, not less than twenty varieties nor more than fifty		$25	$15	$10
Classes 105, 106 and 107. Premiums to be limited to thirty plates each.				
Class 108, No. 1099. Open to the state; any and all kinds of fruits correctly named may enter in this exhibit, the object being to get a large display of different varieties and kinds of fruits	$50	$30	$20	$10
Class 109, No. 1102. Collection of pears, not less than fifteen varieties			$15	$10
No. 1102. Cut out the words "seedlings may be entered" and add premium on:				
Best seedling pear, if worthy				$5
Class 112. Assume the premiums offered by the Horticultural Society, and change date 1900 to 1904.				

Mr. Simpson moved that the changes recommended by Mr. Reeves be adopted. Motion carried.

Mr. Green, Superintendent of Floriculture, recommended additional premiums in that Department for cut flowers in the professional class, amounting to $200. Mr. Ledgerwood moved the adoption of the suggestions, which was seconded by Mr. McDonald, and carried.

Mr. Green, representing the State Horticultural Society, appeared before the Board and asked whether or not the Department of Agriculture would be in favor of ceding to the State Horticultural Society a portion of the land owned by the Department lying east of the Fair Grounds to be made into an arboretum. Mr. St. John moved that the Board reject the proposition of the Horticultural Society, for the reason that by an act of the Legislature the land is already in the hands of the Executive Council to sell, the proceeds of which shall be used to purchase additional land for the Fair Grounds in a more accessible location. Seconded by Mr. Ledgerwood. Carried.

Mr. Johnston moved that classes he added in the Swine Department for Large Yorkshire and Tamworth hogs, premiums to amount to $500.00, and that the 4th and 5th money premiums in the Berkshire class be discontinued. Seconded by Mr. Brown Motion carried.

Mr. Pike moved that the premiums in the Iowa Shropshire class be increased to $8, $6, $4, $2 and $1, and that two ribbon prizes be added, a total increase of $48.00. Second by Mr. Brown. Carried.

Mr. Pike moved that premiums in Department "E" offered for Iowa classes should be made to read, "sheep owned and bred in Iowa." Seconded by Mr. Phillips. Motion carried.

Mr Pike moved that the flock prizes be made to read as follows: "One ram any age; one ewe two years old or over; one ewe one year old and under two; one ewe lamb." Motion seconded and carried.

Mr. Ledgerwood moved that Rule 11, Department E, be changed to read as follows: "Where there is but one exhibitor in a ring two premiums only may be awarded" Seconded by Mr. Pike. Motion carried.

Mr. Pike moved that additional prizes be allowed in the Poultry Department, amounting to $160.00. Seconded by Mr. Olson. Motion carried.

Mr. St. John moved that Premium No. 908, Class 78, be made to read: "Six ripe cucumbers." Motion seconded and carried.

Mr. St. John moved that Class 80 be made to read, "Sweepstakes," instead of "Display of vegetables."

Mr. St. John moved that additional premiums amounting to $75.00 per district be made for county exhibits. Seconded by Mr. Wright. Motion carried.

Mr. Ledgerwood moved that a Committee on Per Diem and Mileage be appointed. Seconded by Mr. Pike. Carried. The President appointed as such committee Messrs. Ledgerwood, Pike and Olson.

Mr. Legoe moved that the revision of premiums in Department "N" be delegated to the Secretary and the Superintendent of the Department. Seconded by Mr. McDonald. Motion carried.

Mr. St. John moved that Rule 12, page 10, of the premium list be revised to read as follows: "No exhibit can be taken away from the grounds before four o'clock p. m. on Friday of the Fair, without permission of the President recommended by the Superintendent of Department." Motion seconded and carried.

Mr. Packard submitted the following report of the Committee on the Adulteration of Foods:

REPORT OF COMMITTEE ON ADULTERATIONS OF FOODS. SEEDS AND OTHER PRODUCTS, AND LEGISLATIVE ENACTMENT RECOMMENDED.

To J. C. SIMPSON, Secretary Department of Agriculture:

Sir—The committee on the adulteration of foods, seeds, and other products beg to submit the following report:

The law requiring this investigation is included in Section Six (6) of the acts creating the State Board of Agriculture, as follows:

"It shall be the duty of the board * * * * to investigate * * * the adulteration of foods, seeds and other products, and to report the results of the investigation, together with recommendations of remedial measures for the prevention of damage resulting therefrom."

The committee engaged the services of the chemist of the Experiment Station of the Iowa State College, Professor J. B. Weems, to make an analysis of the common foods, a list of which will be found appended, to ascertain the extent of the adulteration, the character thereof, whether deleterious or simply fraudulent with intent to lessen the value of the product without making it unwholesome. The report of the chemist is submitted herewith.

Later an arrangement was made with Professor C. N. Kinney, of Drake University, for analysis of foods submitted to him, and the results of his work are also shown herewith.

Your committee has made a careful study of the testimony taken by the committee of Congress, which has had the subject of a pure food law under consideration for ten years, in respect to the adulteration, misbranding and imitation of foods, beverages, drugs, and other products, and even the most casual inquiry into the subject of the extent of adulterations leads to the conclusion that they are the rule and not the exception.

Lard and sausages of various kinds are almost never true to name and seldom without adulterations. Syrups are largely mixed, though sold as pure. Candies, extracts and flavoring matter of all kinds carry injurious ingredients to an alarming extent. Oysters are universally preserved for shipment. Vinegars are sold as cider vinegars, though largely distilled from grains. Jellies, jams and similar goods are usually made with a glucose filler. The same is true of honey and sorghums. Buckwheat flour is almost never pure. Catsups and a large list of prepared foods are colored to cover up inferior stock, and preserved with a chemical that is in most cases deleterious to health. Sugars are adulterated, as are other sweets, by the use of glucose, or corn sugar. Mustards and ground spices of almost every variety are fruitful sources of profit to the adulterator of foods.

Together with the reports of the chemist mentioned above, will be found a list of articles adulterated and their adulterants, taken from a Congressional report.

The states around us have food laws that are more or less affective, and from personal investigations and conversations with the officials of these states and with the salesmen in this and other states, your committee is convinced that Iowa is the dumping-ground for the impure foods driven out of other states. Legislation to protect our people is urgently needed, and with the co-operation of Senator B. W. Newberry, of Clayton county, and Representative B. F. Cummings, of Marshall county, your committee has prepared a bill to cover the situation. This bill is submitted for your consideration, with the recommendation that, if approved, the bill be transmitted to the Governor with the request that he recommend the measure in his message to the General Assembly.

COPY OF IOWA STATE PURE FOOD LAW.

As Enacted by the 31st General Assembly, Feb., 1906.

Be it enacted by the General Assembly of the State of Iowa:

Section 1. The State Dairy Commissioner shall, by this act, become the State Food and Dairy Commissioner, and shall, on and after taking effect of this act, have all the powers, compensations and allowances, and shall be charged with all the duties now imposed by law upon the State Dairy Commissioner.

Sec. 2. In addition to his powers and duties as provided in section one (1) hereof, the commissioner shall be charged with the duty of carrying into effect the provisions of this act and shall have an official seal. He may, with the approval of the Executive Council, appoint such assistants as he may deem necessary, who may exercise the powers now provided by law in the case of milk inspectors, together with those conferred by this act. They shall be paid not to exceed five dollars a day

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NOTE. The bill as herewith printed is the original bill as drawn by the pure food committee, with amendments adopted by the Thirty-First General Assembly, and passed by unamious vote of both branches of the legislature and signed by the Governor. The bill becomes operative July fourth, and under its provisions the State Dairy Commissioner becomes the "State Food and Dairy Commissioner" for the State of Iowa. Much credit for the passage of this bill is due to Hon. S. B. Packard, chairman of the Pure Food Committee of the State Board of Agriculture; to Dairy Commissioner H. R. Wright, Senator B. W. Newberry and Hon. B. F. Cummings, the last two named gentlemen having charge of the measure in their respective branches of the legislature. Advocates of pure food legislation owe to all these gentlemen a debt of gratitude for their efforts in securing the passage of this bill.—*Editor.*

when on duty, besides their actual and necessary traveling expenses when traveling under orders. Their accounts shall be itemized and sworn to, and, when approved by the Commissioner and the Executive Council, shall be paid by warrant of the auditor upon the treasurer out of the sum hereinafter appropriated for carrying out the provisions of this act. The commissioner shall receive five hundred dollars annually in addition to the salary now received by the State Dairy Commissioner.

Sec. 3. The commissioner shall, with the approval of the Executive Council, appoint a chemist, who shall be the official chemist under this act, who shall devote his whole time to the duties of such office. He shall receive a salary of two thousand dollars per year, to be paid in the same manner as the salaries of other state officers. He shall make all the examinations necessary in enforcing the provisions of this act, and shall be furnished necessary laboratory, apparatus, supplies and chemicals to be paid for in the same manner as the accounts of assistants.

Sec. 4. The Commissioner shall, with the approval of the Executive Council, make all necessary rules and regulations for carrying out the provisions of this act, under which the commissioner shall procure from time to time or whenever he has occasion to believe any of its provisions are being violated, or cause to be procured, for examination chemically, microscopically or otherwise, samples of food shipped into this state or offered for sale in this state. The chemist making the examination shall certify the results of his work to the Commissioner.

Sec. 5. If it shall appear from any such examination that any of the provisions of this act have been violated, the Commissioner shall at once certify the facts to the proper county attorney, with a copy of the results of the analysis, duly authenticated by the analyst under oath. It shall be the duty of every county attorney to whom the commissioner or his assistants shall report any violation of this act, to cause proceedings to be commenced and prosecuted without delay for the fines and penalties in such case provided. An attorney may be appointed by the governor when he deems advisable, to prosecute such cases, where the county attorney refuses to act.

Sec. 6. No person, firm or corporation, by himself, officer, servant or agent, or as the officer, servant or agent of any other person, firm or corporation, shall manufacture or introduce into the state, or solicit or take orders for delivery, or sell, exchange, deliver or have in his possession with the intent to sell, exchange or expose or offer for sale or exchange, any article of food which is adulterated or misbranded, within the meaning of this act. Provided, that none of the penalties set forth in this act shall be imposed upon any common carrier for introducing into the state, or having in its possession any adulterated or misbranded articles of foor, where the same were received by said carrier for transportation in the ordinary course of its business and without actual knowledge of the adulteration or misbranding thereof. Provided, that any manufacturer, wholesaler or jobber may keep goods specifically set apart in his stock for sale in other states, which might otherwise be in violation of the provisions of this act.

SEC. 7. The word "commissioner," whenever used in this act, shall be taken to mean the State Food and Dairy Commissioner herein provided for. The word "food," as herein used, shall include all articles used for food, drink, confectionary or condiment, by any man or domestic animals, whether simple, mixed or compound. The term "misbranded," as herein used, shall apply to all articles of food, or articles which enter into the composition of food, the package or label of which shall bear any statement regarding the ingredients or substances contained in such article, which statement shall be false or misleading in any particular, and to any food or product which is falsely branded as to the state or country in which it is manufactured or produced, or shall bear any false statement regarding the net weight or quantity contained in the package.

SEC. 8. For the purpose of this act, an article of food shall be deemed to be adulterated:

First, If any substance or substances has or have been mixed and packed with it so as to reduce or lower, or injuriously affect its quality, strength or purity.

Second, If any substance or substances has or have been substituted wholly or in any part for the article.

Third, If any valuable constituent of the article has been wholly or in part abstracted.

Fourth, If it be in imitation of, or offered for sale, under the specific name of another article.

Fifth, If it be mixed, colored, powdered or stained, in a manner whereby damage or inferiority is concealed.

Sixth, If it contains any added poisonous ingredients, or any ingredient which may render such article injurious to health, or if it contains saccharine or formaldehyde.

Seventh, If it be labeled or branded so as to deceive or mislead the purchaser, or purport to be a foreign article when not so.

Eighth, If it consist of the whole or any part of a diseased, filthy, decomposed or putrid animal or vegetable substance, or any portion of an animal unfit for food whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter: provided, that an article of food which does not contain any added poisonous or deleterious ingredient shall not be deemed to be adulterated in the following cases:

1. In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food under their own distinctive names and not included in definition fourth of this section; provided that candies and chocolates shall be deemed to be adulterated if they contain terra alba, barytes, talc, chrome yellow, or other mineral substances, or poisonous colors or flavors, or other ingredients deleterious or detrimental to health; provided, that in case of baking powders, each can or package shall be plainly labeled so as to show the name of each and every ingredient contained therein.

2. In the case of articles labeled, branded or tagged, so as to plainly indicate that they are mixtures, compounds, combinations, imitations or blends, provided that the same shall be labeled, branded or tagged, so as to show the exact character and constituents thereof; and provided further that nothing in this act shall be construed as requiring or compelling proprietors or manufacturers of proprietary foods which contain no unwholesome added ingredients to disclose their trade formulas, except in so far as the provisions of this act may require to secure freedom from adulterations or imitation.

Sec. 9. Labels required by this act shall be distinctly printed in the English language in legible type no smaler than brevier heavy gothic caps, and shall be placed upon the outside of each package and contain the name and address of the manufacturer, packer or dealer, and the words, "This (followed by the name of the article of food) is composed of the following ingredients and none other," and immediately after said words shall be printed upon said label, in the style and manner herein specified, the true and correct name of each and all the ingredients contained in or constituting a component part to such mixture, compound, combination, imitation or blend, and if artificially colored or preserved, the name of each and every such added substance shall be plainly stated on the label. There shall be such a contrast between the color of the label and the color of the ink used in printing the label as heretofore provided, that the label shall be easily and plainly legible.

Sec. 10. Any person who manufactures or exposes for sale, or delivers to a purchaser any article of food, shall furnish, within business hours, and upon payment or tender of the selling price, a sample of such food to any person duly authorized by the commissioner to receive the same, and who shall apply to such vender, or person delivering to a purchaser such article of food for such sample for such use in sufficient quantity for the analysis of any such article or articles in his possession. In the presence of such person and an agent of a commissioner, if so desired by either party, said sample shall be divided into three parts, and each part shall be sealed with the seal of the commissioner. One part shall be left with the dealer, one delivered to the commissioner, and one deposited with the county attorney for the county in which the sample is taken. The having in possession by any person who manufacturs or exposes for sale, any adulterated or misbranded food, within the meaning of this act, shall be prima facie evidence of having in possession with intent to sell in violation of its provisions.

Sec. 11. Any person, firm, corporation, or agent thereof, who refuses to comply, on demand, with any of the requirements of this act, or who shall violate any of its provisions, or who shall obstruct or hinder the commissioner, or any of his assistants, in the discharge of any duty imposed by this act, shall be guilty of a misdemeanor ,and upon conviction thereof, shall be punished by a fine not exceeding one hundred dollars.

Sec. 12. The Commissioner shall, from time to time, with the approval of the Executive Council, issue a printed bulletin, showing the results of inspections, analyses, and prosecutions undertaken under this act, together with such general information as may be deemed suitable. Such bulletins shall be printed in such numbers as may be directed by the Executive Council, and shall be issued to the newspapers of the State and to all interested persons.

Sec. 13. For the purpose of enabling the commissioner to enforce the provisions of this act for the compensation and expenses of assistants and experts, for necessary travelling and micellaneous expenses, and for all other expenses herein provided, the sum of ten thousand dollars ($10,000) annually, or so much thereof as may be necessary is hereby appropriated from the treasury not otherwise appropriated.

Sec. 14. All goods purchased or received by either wholesale or retail dealers of this state prior to July first, nineteen hundred six (1906) shall be exempt from the provisions of this act to July first, nineteen hundred seven (1907).

Sec. 15. Upon the prosecution of a corporation for violation of the provisions of this act, or of section forty-nine hundred eighty-nine (4989) of the code, and information filed before a justice of the peace having jurisdiction, the said justice of the peace shall forthwith issue notice to the corporation which shall substantially notify the defendant of the charges contained in the information and that it must forthwith appear and answer the same, which notice may be served by any peace officer in any county of the state on any officer or agent of the defendant corporation by reading the same to him and leaving with him a copy thereof; said notice shall be returned to the justice of the peace without delay with proper return of its service, and from and after two days from the time of making such service the defendant corporation shall be considered to be in court, and all further proceedings shall be the same as against an individual defendant.

Sec. 16. Section forty-nine hundred eighty-six (4986), of the code is hereby amended by striking out in the second line thereof, the words and characters "food, drink or", and in the third line thereof the words and characters "food, drink or," and by striking out all after the word "same" in the fourteenth line of said section, and by changing the semicolon after the word "same" to a period.

Sec. 17. Section forty-nine hundred eighty-two (4982), forty-nine hundred eighty-four (4984), forty-nine hundred eighty-seven (4987), forty-nine hundred ninety-three (4993), forty-nine hundred ninety-four (4994), forty-nine hundred ninety-five (4995), forty-nine hundred ninety-six (4996), forty-nine hundred ninety-seven (4997), and forty-nine hundred ninety-eight (4998) of the code, and sections forty-nine hundred eighty-four-"a" (4984-a), and forty-nine hundred eighty-four-"b" (4984-b) as they appear in the supplement to the code, are hereby repealed.

RESULT OF ANALYSES MADE BY PROF. J. B. WEEMS, OF AMES.

Ames, Iowa, November 21, 1903.

Governor S. B. Pacard, Marshalltown, Iowa.

My Dear Sir—Please find enclosed the report of the investigation of food products used in our state. I have made the report as full as possible, but I regret that the limited funds at our disposal naturally restricted the work. I have endeavored to add to the work by supplying some necessary results from the reports of other states. If any suggestion comes to you in which I can add to the report, I will be glad to do so.

Yours very truly,

J. B. Weems.

The amount of money which could be used for the investigation was limited, and it was decided to carry on the work as far as the funds would allow.

The first group of products selected were the vinegars. Twelve samples were analyzed, with the results as shown in the table, which is a part of this report. From the chemical analyses, it will be seen that eight of the twelve samples were not cider vinegar, or, in other words, 66 2-3 per cent of the products sold as cider vinegar are not produced from cider.

In this connection it is of interest to note that in Massachusetts, during the year ending September 20, 1902, that of 270 samples of vinegar, 178 were condemned as not meeting the requirements of the state law. In Ohio, twenty-four samples of a total of seventy were regarded as adulterated. Many of the samples were below the strength required by the law. Many of the retail dealers have no means of determining whether a vinegar is pure or not. They have simply the word of the jobber. I have in mind an example where the vinegar sold by a merchant as cider vinegar, when it proved, on examination, to be a spirit vinegar, he reported the fact to the dealer in Chicago, and it was claimed by them that they purchased the product for cider vinegar and were themselves misled by the statement of the makers. Some of the dealers claim that the price is an indication whether the product is pure cider vinegar or not. There is no doubt that the vinegars sold to the public are grossly misrepresented.

JELLIES, PRESERVES AND SYRUPS.

Twenty-nine samples of these products were examined, as shown by the results of the chemical analyses. In twelve of the samples, glucose was found to exceed 50 per cent in the product, and in seventeen in an amount exceeding 25 per cent of the product. In many of the other samples, the amount of cane sugar that is present is very small.

In the report of the Food Commissioner of Ohio for 1902, nineteen samples of syrup were analyzed, and eight were adulterated. The report for August, 1902, of the Dairy and Food Commissioner of Michigan shows that two samples of molasses and seventeen samples of jellies were analyzed, and all found to be adulterated.

Many of these substances are labeled indicating that they are a compound product. Most of these substances are artificially colored in order to make the imitation complete. It is of interest also to note that on many of the labels there is printed something like the following, which is taken as an example: Compound, 50 per cent simple syrup, 50 per cent corn syrup, colored and flavored. Another example is: Syrup compound, 80 per cent corn syrup, 20 per cent sugar syrup.

On one jar of jelly, in very small letters, is printed: Sixty per cent apple juice, 35 per cent corn syrup, 5 per cent sugar, aritficially colored. This product was labeled Currant Jelly. Another label stated that the compound was 50 per cent fruit, 25 per cent corn syrup, 20 per cent sugar and 5 per cent spices and flavors. Many of these products were prepared in other states, and these statements were printed on the label in order to satisfy the demands of pure food laws of many of the states. The results of various products of the jams, jellies and syrups show the relation of pure cane sugar and glucose.

MUSTARDS.

In the analysis of mustards, our work, owing to limited funds at our disposal for the work, were only of qualitative nature. It will be noticed, however, that many of the samples gave heavy indication for starch, which is the common adulteration of mustard, and may be present to the extent of 50 per cent of the product.

BAKING POWDERS.

In baking powders, it will be noticed that alum is present in three of the samples sent to us for examination; and the cream of tartars, of the four samples examined, only two can be said to be pure.

CATSUPS.

In catsups, it was found that they were preserved by a salt of benzoic acid, artificially colored.

CREAM OF TARTAR.

Cream of tartar is used extensively in the household, largely in connection with bread making. The substance is in many cases adulterated to a large extent. Starch, calcium phosphate and calcium sulphate (gypsum) being used for this purpose. For an illustration, the following analysis will show to what extent this substance has been adulterated:

Alum	62.27
Silica	1.90
Lime	.76
Starch	14.39
Cream of tartar	21.58
Total	100.00

Or this:

Cream of tartar	None
Acid calcium phosphate	25.30
Calcium sulphate	24.10
Starch	10.60
Moisture	40.00
Total	100.00

The above results are taken from a report of the Ohio Food Commissioner of a few years ago. The last report of the same state shows that of the twenty-seven samples collected none were found to be adulterated. This was not so, however, in the past years, as it was very common to have samples adulterated to the extent given as stated above.

In Massachusetts, of 326 samples collected, twenty were found to be adulterated. Four samples were tested in connection with this investigation, and two gave indications of adulterations.

SPICES.

The spices used in the household are no doubt adulterated to a greater extent than any other of the products used as food.

Pepper is adulterated with ground pepper shells, ground olive pits, corn meal, and roasted cocoanut shells.

Allspice is adulterated with wheat and exhausted ginger.

Cassia is adulterated with exhausted ginger and cassia buds.

Cayenne is adulterated with corn starch and turmeric.

Cloves are adulterated with allspice, nut shells, sawdust, sand and sweepings.

Ginger is adulterated with turmeric, buckwheat and powdered charcoal.

Mace is adulterated with corn starch and wild mace.

From the results which have been obtained from the investigation of the products sold for food in Iowa and the results from the reports of the food commissions of other states, there is no doubt but there is need of a pure food law in Iowa. Such a law will protect the honest manufacturer and the consumer. The bulletin and reports will furnish to everyone engaged in supplying food to the citizens of Iowa information which will enable them and the consumers to know what substances are pure and those which are impure. Such a law should be so enacted that it can be of great value to the people when enforced in an intelligent manner.

ANALYSES OF JELLIES, JAMS AND SYRUPS.

SYRUPS AND MOLASSES.

No.	Prepared by	Name.	Cane Sugar.	Glucose.
1.	Champion Syrup Refining Co.	Compound Orange	14.96	77.96
2.	William Mannierre	Old Manse	58.30	.40
3.	Oriental Mfg. Co.	Superior Mixed Honey	8.37	73.84
4.	Chicago Refinery	Pure Louisiana	11.64	50.49
5.	C. C. Prouty Co.	"Peerless Drips"	8.87	75.84
6.	Warfield, Pratt, Howell Co.	Matchless	9.18	77.15
7.	C. W. Goyer & Co.	Louisiana Sugar House	25.94	1.86

JELLIES.

1.	The J. Weller Co.	Raspberry Jelly	10.69	66.12
2.	The J. Weller Co.	Grape Jelly	2.78	61.27
3.	The J. Weller Co.	Currant Jelly	1.39	54.52
4.	The J. Weller Co.	Blackberry Jelly	4.03	60.66
5.	The J. Weller Co.	Strawberry Jelly	14.32	52.56
6.	The Iowa Fruit Preserv. Co.	Pomona Apple	20.77	
7.	The E. G. Dailey Co.	Boiled Apple Cider	12.70	33.31

JAMS, PRESERVES.

1.	The J. Weller Co.	Plum Butter	3.13	26.66
2.	Bliss Syrup Refining Co.	Plum Preserves	3.84	15.17
3.	Bliss Syrup Refining Co.	Orange Marmalade	4.78	13.38
4.	Franklin, MacVeagh & Co.	Priscilla Preserves, Red Raspberry	10.19	44.00

MUSTARDS.

	Prepared by	
1.	**Mennig & Slater**	Test for starch showed heavy blue coloration.
2.	**Eddy & Eddy**	Very little starch.
3.	**Warfield, Pratt, Howell Co.**	
4.	**Tone Bros.**	
5.	**Marshall Vinegar Co.**	Starch in small quantity.
6.	**Ontario Preserving Co.**	
7.	**Reid, Murdoch & Co.**	Starch in quite large quantity.
8.	**H. J. Heinz Co.**	Starch is present, heavy blue coloration.
9.	**The Letts, Fletcher Co.**	Starch is present.
10.	**J. J. Colman**	

BAKING POWDERS AND CREAM OF TARTARS.

BAKING POWDERS.

1.	Tone Bros.	Alum present.
2.	Superb Baking Powder Co.	Alum present.
3.	James H. Forbes	Alum present.

CREAM OF TARTARS.

4.	Tone Bros.	No calcium, phosphates, starch found.
5.	E. A. Knudson	Starch, calcium, phosphates, sulphates and alum found.
6.	Laughran & Bauer	Trace of calcium.
7.	C. Hamilton	Starch, alum, calcium, phosphates and sulphates found.

CATSUPS.

1.	Mennig & Slater	Preservative, benzoic acid.
2.	Rollins Vinegar and Pkl. Co.	Preservative, benzoic acid.
3.	Reid, Murdoch & Co.	Preserved by benzoic acid.

PICALILLI.

1.	Rollins Vinegar & Pkle. Co.	Preservative, saccharin.

ANALYSES OF VINEGARS.

No.	Purchased from	Per Ct. Acidity	Solids	Ash.	Remarks
1.	J. A. Kenyon	4.43	.359	.079	Malic acid, sulphates, phosphates not present.
2.	Crispin & Duncan	3.99	.35	.034	Malic acid, sulphates, phosphates not present.
3.	S. C. Brumfield	4.66	.52	.097	Malic acid, sulphates, phosphates not present.
4.	J. J. Grove	4.80	.37	.03	No malic acid. Phosphates present in very small quantity.
5.	J. B. Kooser & Co	4.87	2.01	.19	Phosphates were present in some quantity. Strong indication of malic acid.
6.	C. Hamilton	5.65	.61	.047	Very small quantity of phosphates present. No precipitate with lead acetate.
7.	B. A. Knudson	5.92	1.90	.29	Phosphates present in quite large quantity. Heavy precipitate with lead acetate.
8.	T. J. Miller & Son	5.78	.52	.029	Phosphates present in very small quantity. Slight precipitate with lead acetate.
9.	T. J. Miller & Son	4.83	.68	.073	Very small quantity of phosphates. No precipitate with lead sub acetate.
10.	Tilden Bros. & Co.	5.04	3.12	.30	Heavy precipitate of phosphates. Good test for malic acid.
11.	J. W. Adams	4.84	.40	.039	No phosphates. No malic acid.
12.	J. J. Grove	5.47	1.95	.26	Strong test for phosphates. Slight precipitate with lead acetate.

JAMS, PRESERVES.

No.	Prepared by	Name.	Cane Sugar.	Glucose.
5.	Frankiin MacVeagh & Co.	*Strawberry	14.64	30.14
6.	Franklin MacVeagh & Co.	Apricot	23.12	35.01
7.	Mannierre-Yoe Syrup Co.	*Tomato	3.29	66.69
8.	Manniere-Yoe Syrup Co.	Quince Quaker Jam	8.62	68.44
9.	The Iowa Fruit Preserv. Co.	Plum Butter	2.13	
10.	Reid, Murdoch & Co.	Damson Plum Pres.	2.28	
11.	Kenwood Mfg. Co.	Pear Butter	6.56	20.36
12.	Reid, Murdoch & Co.	Blackberry Jam	41.52	
13.	Reid, Murdoch & Co.	*Strawberry Jam	23.81	
14.	Reid, Murdoch & Co.	*Red Raspberry	23.10	
15.	Reid, Murdoch & Co.	*Red Currant	23.87	

Fruit Shrub Phosphate-Strawberry, prepared by Reid, Murdoch & Co., pink artificial coloring.

*Artificially colored.

RESULT OF ANALYSES MADE BY PROF. C. N. KINNEY, OF DRAKE UNIVERSITY.

Product Examined.	No. of samples examined.	No. adulterated.	No. unadultr'ted	Sophistication.	Adulterating Material
Milk	125	75	50	Water and removal of cream.	Formaldehyde, benzoic acid, borax, salicylic acid.
Cream	20	15	5	Gelatin.	Formaldehyde, boracic acid.
Sausage	15	14	1	Crackers, bread crumbs, coloring material.	Sulphites, boric acid, salicylic acid.
Oysters	5	5	0		Formaldehyde, boric acid.
Mincemeat	2	2	0		Sulphites, boric acid.
Beer	150	15	135	Sugar, gelatin, glycerine, coloring material.	Nitre, arsenic, gentian.
Vinegar	25	15	10	Acetic sulphuric, hydrochloric, phosphoric acids, water, coloring material.	
Cider	10	5	5	Sugar, acetic acid, coloring material.	
Butter	15	6	9	Sterine, lard, cotton seed oil.	
Baking powder	25	15	10	Flour, starch.	Alum.
Tea	5	3	2	Willow leaves, coloring materials.	Tannic acid.
Confectionery	10	8	2		Paris green, lead chromate, ultramarine.
Coffee	..	..	..	Clay balls.	
Strawberry Jam	..	..	..	Pumpkin and timothy seed.	

Adulterated Articles and Their Adulterants

NAME.	DELETERIOUS.	COMMERCIAL FRAUDS.
Arrowroot.	?	Other starches which do not have some hygiene effect.
Alcoholic liquors	Fusel oil, tannin, logwood	Water, coloring matter, burnt sugar.
Brandy	Essential oils	Water, burnt sugar.
Bread	Alum, sulphite of copper, ammonia	Flour other than wheat, potatoes and inferior flour.
Butter.	Copper	Water, other fats, excess of salts, starch, oleomargarine, cotton oil, olive oil, peanut oil, beef suet. The proper proportion of water should be 5 to 10 per cent. (Error).
Baking powder	No standard	Starch and flour in excessive quantities.
Black pepper	Sand, red clay	Buckwheat flour and hulls, P. D., cracker crumbs, Indian meal, wheat flour, charcoal bran, linseed meal, cocoanut shells, mustard husks, sawdust, olive seeds, cayenne and ship bread.
Beer	Salicylic acid, tobacco, seed or cocculus indicus.	Burnt sugar, licorice, treacle, glucose, quassia, coriander, caraway seed, cayenne pepper, soda, salt (to increase thirst), artificial carbonic acid gas, grains other than barley. As their is no standard, it is doubtful whether the last is an adulterant, many preferring rice to malt beer. Beer is often not properly aged, artificial clarifying.
Cheese.	Salts of mercury in rind	Skim milk, (for whole cream), oleomargarine, cotton oil, etc., false coloring and lard.
Cottonseed oil	?	Used extensively for oleo., lard, butter, olive oil etc.
Candy	Poisonous colors and flavors terra, alba, talc, barytes, chrome yellow, arsenic, sulphate of copper, prussic acid, tartaric acid, fusel oil, analyne dyes.	Glucose(this article is now generally used and when properly made is not injurious), starch, flour, grape sugar.
Canned goods	Salts of copper, acids, lead, decapey.	Excess of water, inferior goods, damaged goods.
Coffee	Green coloring matter, other analyne colors	Imitation beans (both green and roasted), yeas, beans, chicory, rye, chefus, almond shells, treated with molasses and roasted, polishing, burnishing, weighting with water, acorns, burnt sugar, pea hulls.
Chrome yellow.	Used by confectioners and bakers to give a yellow color. ***Very dangerous***	
Cider.	Salicylic acid, dried apples, added to chemical mixtures.	
Cocoa and chocolate	Oxide of iron and other coloring	Animal fats, starch, flour, sugar and caramel.
Cream of tartar	Sulphate of lime, alum, terra alba, plaster, tartaric acid.	Corn starch, flour.

ADULTERATED ARTICLES AND THEIR ADULTERANTS—CONTINUED.

NAME.	DELETERIOUS.	COMMERCIAL FRAUDS.
Cayenne pepper	Red lead, chromate of lead.	Flour, salt, ship bread, Indian meal, ground beans and peas, flour and tumeric. (These adulterations will apply to all adulterations of spices with slight variations). Many spices are simply of the above ingredients with a very small portion of the real product and a good deal flavoring extracts.
Flour	Alum (sometimes to give whiteness), barytes (claimed)	Peas, ground rice, corn meal, fourline, and product of glycerine
Ginger		Tumeric, cayenne pepper, mustard, inferior and refused ginger.
Gin	Alum salts, spirits of turpentine, artificial essence.	Water, sugar.
Glucose	Excess of oil of vitriol and lime	This article is probably one of the most extensively used adulterants in the country. When pure, I do not believe it to be injurious to health. It is used to adulterate the following: Sugar, cane and maple syrups, molasses, jellies, jams, confectionery, vinegar, liquor, wines, honey, beer. It is used for cakes, sauces and tobacco.
Honey		Gucose, sugar, syrups, molasses and raw sugar.
Horse radish		Turnips.
Isinglass		Gelatin.
Jams and jellies	Artificial essence and dyes, preservatives	Glucose, gelatin, jelly made from refuse fruits, cores and parings.
Ice cream	Analyne and other coloring matter, essence of bitter almond	Buttermilk, skim milk, corn starch.
Lard	Caustic, lime, alum	Starch, stearin, salt, cotton-seed oil and water.
Mustard	Chromate of lead, sulphate of lime, Martin's yellow, gypsum, turmeric, weighted with terra alba	Yellow lakes, flour, cayenne, mustard colored with tumeric, diluted with starch, wheat and rice flour.
Milk	Water (because it reduces the nourishing qualities of the article), preservates from diseased and filthy cattle, boracic acid, borax, salicylic acid.	Burnt sugar, anotto, calf's brains.
Macaroni	Tumeric and Martin's yellow, saffron	Glucose, syrups.
Meat	Infested with parasites, diseased	
Oleomargarine	Refuse pork (liable to produce trichinae)	Bone fats, candle grease, soap grease, horse fat.
Pickles.	Salts of copper and alum	Poor vinegar, poor spices.
Peas	Salts of copper	
Preserves	Aniline colors, gelatine, preservatives	Apples, pumpkins, molasses, glucose.
Pepper, described above.		
Pimento		Ship bread.

Sago		Potato starch.
Rum	Cayenne pepper, artificial essence	Glucose.
Spices, above described		
Sugars	Salts of tin and salts of lead, terra alba, glue, sand, gypsum, (putrid blood is often used to purify it)	Grape sugar, flour starch, rice flour, bean dust.
Syrups	Salts of tin	Glucose, dexterin.
Tea	Prussian blue, plumbago gum; weighting-nitric acid, sand, soapstone, china clay, gypsum.	Foreign leaves, spent tea, leaves dried over, inferior qualities
Vinegar	Sulphuric, hydrochloric, pyroligneous acids..	Burnt sugar, water, wine and meal vinegars colored and sold in imitation of cider vinegar.
Wines	Aniline colors, crude brandy, artificial essences, and coloring matter.	
White pepper		Starch, flour.

Mr. Cameron moved that the report of the Committee on Adulteration of Foods be adopted; seconded by Mr. McDonald. Motion carried.

Mr. Cameron moved that one hundred and fifty dollars ($150.00), or as much thereof as is necessary, be appropriated to cover further expenses in perparing report of Committee on Adulteration of Foods. Motion seconded and carried.

The Secretary presented the matter of purchasing a complete set of "Wallaces' Registers." Mr. Brown moved that the Secretary be instructed to purchase the books at the price mentioned, ninety-five dolars ($95.00). Seconded by Mr. McDonald. Carried.

Secretary presented a letter from Sig. A. Liberatti relative to an engagement for the next State Fair at $450.00 per day for an engagement of not less than six days. Mr. Packard moved that the matter be referred to the Executive Committee with power to act; seconded by Mr. Brown. Motion carried.

The question of offering a second prize in the scholarship contest was discussed, but no action was taken.

The Committee on Per Diem and Mileage reported as follows:

MR. PRESIDENT:

Your committee on Per Diem and Mileage desire to report as follows:

	Days	Rate	Amount	Miles	Amount	Total
W. W. Morrow	6	4.00	24.00	82	8.20	$ 32.20
C. E. Cameron	6	4.00	24.00	140	14.00	38.00
R. S. Johnston	6	4.00	24.00	158	15.80	39.80
C. W. Phillips	6	4.00	24.00			24.00
W. C. Brown	6	4.00	24.00	102	10.20	34.20
R. T. St. John	6	4.00	24.00	195	19.50	43.50
S. B. Packard	6	4.00	24.00	58	5.80	29.80
T. C. Legoe	6	4.00	24.00	100	10.00	34.00
M. J. Wragg	3	4.00	12.00	16	1.60	13.60
C. F. Curtiss	1	4.00	4.00			4.00
John Ledgerwood	6	4.00	24.00	87	8.70	32.70
M. McDonald	6	4.00	24.00	65	6.50	30.50
O. A. Olson	6	4.00	24.00	155	15.55	39.55
H. L. Pike	6	4.00	24.00	200	20.00	44.00
Total						$439.85

JOHN LEDGERWOOD,
H. L. PIKE,
O. A. OLSON,
Committee.

Mr. Ledgerwood moved the adoption of the report as read. Seconded by Mr. McDonald. Motion carried.

Mr. McDonald moved that all unfinished business be referred to the Executive Committee with power to act. Seconded by Mr. Ledgerwood. Motion carried.

Mr. Packard introduced the following resolution and moved its adoption, which motion was seconded and carried:

Resolved, That the Board of Agriculture heartily commends the services of its secretary, J. C. Simpson, and believes that the salary allowed by the law of the State is not a just compensation for the work and the merit of service; therefore the Board recommends the General Assembly to amend the law and increase the salary to twenty-two hundred dollars ($2,200).

On motion the Board adjourned, to meet at the call of the President.

J. C. Simpson,
Secretary.

SYNOPSIS OF BOARD AND COMMITTEE MEETINGS,

1905.

EXECUTIVE COMMITTEE MEETING, FEB. 1, 1905.

Committee met on call of President with all members present, as were also members of the Board, Brown and Phillips.

Members discussed the receipts and contracts for the Priviledge Department at length, and it was the unanimous opinion of those present that a material increase should be made in the privileges for the Fair of 1905 over those of former years. It was agreed that in the use of tickets in the privilege department the Superintendent should not give to exceed one ticket a day for ten dollars paid. It was further agreed that all helpers tickets issued by the superintendent of the different Departments must be given a check number for identification in case of fraudulent use.

In the matter of a claim on file in the Secretary's office for doctor and hospital service of the boy injured at the fair of 1904, it was agreed that the matter be referred to the Secretary and Attorney General for settlement, it being the unanimous opinion of those present that, while the Department was not liable for the sake of avoiding any unpleasant litigation it would be better to settle the same if a satisfactory agreement could be arranged.

The Secretary and Superintendent of Grounds were instructed to have the barn in the forage department taken down and rebuilt on location which had been agreed upon near the south entrance.

The Secretary was instructed to purchase garbage cans for use in the Privilege Department.

Secretary presented communication from the Des Moines Driving Club, asking that the fair grounds be leased to them for the purpose of conducting a race meeting sometime during the summer. On motion it was agreed that the committee did not have authority to lease the grounds for this purpose, in case the said Des Moines Driving Club desired to sell any privileges contrary to the law.

Mr. Cameron and Mr. Simpson were appointed a sub-committee to go to Chicago and meet with parties who had made propositions in regard to amusements for the State Fair of 1905.

J. C. SIMPSON,
Secretary.

EXECUTIVE COMMITTEE MEETING. FEB. 21, 1905.

As per resolution of the Committee at their meeting on Feb. 1st, Mr. Cameron and Mr. Simpson made a trip to Chicago and met with several parties who submitted propositions for attractions at the State Fair, but no contracts were made, it being deemed advisable to let them go over until some future meeting of the Executive Committee, when they would meet to take up this matter.

J. C. SIMPSON,
Secretary.

EXECUTIVE COMMITTEE MEETING. MARCH 2, 1905.

Committee met on call of President with all members present.

Mr. E. W. Randall, Secretary of the Minnestota State Fair, on invitation of the Committee, met with them.

The Secretary presented proposition from the O'Donnell Fireworks Co., of Chicago, to put on a spectacular show at the fair. The matter was discussed at some length, but no final decision was reached, the Committee desiring to await the meeting and action of the Minnesota State Fair management, as they desired to act together in this selection of a night show. Quite a number of different attractions and amusements were discussed with Mr. Randall, it being the opinion of the Committee that if the two fairs worked together it would work to the mutual benefit of both. Mr.Randall read a letter from parties in Montana regarding a twenty mile relay race by lady riders. It was agreed by the Committee that in case Mr. Randdall could arrange for this race for both fairs that a contract which would not exceed $2,000 should be made.

J. C. SIMPSON,
Secretary.

EXECUTIVE COMMITTEE MEETING. MARCH 3, 1905.

Committee met with all members present. A visit was made to the Fair Grounds for the purpose of looking over the improvements which had been contemplated for the year.

The Secretary and Superintendent of Grounds were instructed to change the entrance to the quarter-stretch, as per arrangement by the Committee this day. Also to make improvements in the grand stand by removing the first row of seats in the west stand and arranging the entrance for the purpose of installing turnstiles.

The Secretary and Superintendent of Grounds were also instructed to have an 84 inch woven wire fence, similar to the fence erected the previous year, erected as follows: From the corner south of the old dairy building to a line south and west of the entrance at Rock Island Avenue, and from the north entrance of Grand Avenue to the northwest corner of the grounds. They were also instructed to purchase all material and employ all labor necessary to carry on the work outlined by the Committee.

Secretary authorized to issue warrants in payment of pay roll when same was O. K'd by the Superintendent of Grounds. Also to issue warrants in payment of Freight bills or any other bills requiring immediate payment.

Secretary and Superintendent of grounds were instructed to have erected a small kitchen on the east end of the dining hall, known as the old dairy building, and otherwise arrange the interior of said dining hall as per agreement of the committee.

J. C. SIMPSON,
Secretary.

EXECUTIVE COMMITTEE MEETING. TUESDAY, APR. 4, 1905.

The Committee met at call of President at the Secretary's office at 9 o'clock A. M., with all members present. The President stated that the meeting was called for the purpose of closing the fair amusements program, selecting advertising matter etc. It was decided to take up the first day with the amusement feature of the fair.

The committee had before them two propositions for the night show; one from Capt, J. W. O'Donnell of the O'Donnell Fireworks Co., in which he proposed to put on the "Seige of Port Arthur" and a fireworks program, the details of which are found in the synopsis of the program presented, on file in this office. Mr. B. F. Gregory, representing the Pain Pyrotechnic Co., was before the committee with a proposition to put on the "Seige of Port Arthur". After considering the propositions very carefully the committee, on motion of Mr. Cameron, decided to contract with Capt. J. W. O'Donnell for putting on the "Seige of Port Arthur" four nights, beginning Aug. 28th, closing Aug. 31; contract not to be signed or in effect until after Mr. O'Donnell furnished surety bond in the sum of $2500.00, such bond to be approved by the Secretary. The terms for this contract are to be $3400.00 for four nights, with the weather clause, which are fully set forth in the contract.

Mr. Harold A. Bushea, General Director of the Gaskill Shows, was before the committee and presented a proposition for placing his shows at the Iowa State Fair of 1905; same to be in an enclosure, price of admission to the enclosure ten cents. Mr. Bushea's proposition for placing these shows was as follows: The Gaskill Carnival Co., to get 75 per cent of all receipts, 25 per cent to go to the fair management; the fair management to furnish only ground space for the above shows. Another proposition submitted by Mr. Bushea was, providing he furnish the day amusements in front of the grand stand, to consist of eight acts, that we divide on the following terms; 8 per cent to the Gaskill Carnival Co., and 20 per cent to the fair management. There were twelve different shows which Mr. Bushea submitted to be put on the Pike the admission to same being from ten to twenty-five cents. This matter was looked over very carefully by the committee, they being perfectly satisfied with the terms presented by Mr. Bushea and of the high character of the shows, but decided that as the matter had never been discussed at our Board meeting it was not advisable to put on a Pike this year.

A contract was made with Mr. F. M. Barnes, of the Western Theatrical Exchange, for the following attractions for the fair of 1905, for the sum of $1650.00, as follows: Wahlund & Tekla in a strong act $200.00; the five Flying Moores in casting and return act for $350.00; the eight Bedouin Arabs for $500.00; the Nelson Family for $600.00.

Signor A. Liberati was before the committee in regard to securing an engagement for Liberati's band of forty-eight pieces at the Iowa State Fair of 1905. The committee made an offer to Sig. Liberati of $1875.00 for six days and four evenings, beginning with a Sunday afternoon concert and closing Friday afternoon.

J. C. SIMPSON,
Secretary.

EXECUTIVE COMMITTEE MEETING. WEDNESDAY, APR. 5, 1095.

The Executive Committee met at Secretary's office at 9 o'clock, A. M. with all members present. The entire time of the committee for this day was devoted to looking over and selecting advertising matter for the Iowa State Fair of 1905. After carefully going over all the samples presented by representatives of the different firms present the following contracts for advertising matter were made:

250 horse covers from Brown & Bigelow, Minneapolis	$ 112.50
1,000 signs $30.00 and 600 pieces of novelties $72.00, M. Parrott & Sons, Waterloo, Ia.	102.00
Bill from Gray Lithographing Co., New York	262.50
It was further decided to order 5,000 hangers from the Iowa Publishing Co. of Davenport, Ia., same to be printed in three colors, for the sum of	240.00
Total	$ 717.00

THURSDAY, APR. 6, 1905.

The committee spent a considerable portion of the day at the fair grounds going over and outlining the work preliminary to the fair of 1905.

In the matter of an entrance at Grand Avenue, Smith & Gage, architects, were employed to prepare a plan and submit same to the Executive Committee for approval. Upon receiving this sketch Secretary was instructed to have zinc etchings made and send one to each member of the Board together with estimate of the cost of the entrance, for their approval.

A sum not exceeding $200.00 was appropriated for the purpose of planting and arranging grounds around the new Agricultural Building.

The matter of turnstiles was discussed at some length, and it was decided that the Executive Committee, together with Mr. Deemer, Supt. of Grounds, should make a trip to St. Louis for the purpose of getting information in regard to installing turnstiles, and to look over other materials which the Chicago Wrecking Co., had for sale which might be used to good advantage on the State fair grounds.

SPECIAL COMMITTEE WORK.

A special committee composed of C. E. Cameron, Vice-President, James H. Deemer, Superintendent of Grounds, and J. C. Simpson, Secretary made a trip to St. Louis and purchased material from the Chicago Wrecking Co., to the amount of $1300.00. This included turnstiles, chopper-boxes, cases, tables, etc., for use on the Iowa State Fair Grounds. Itemized bill contained in statement on file.

J. C. SIMPSON,
Secretary.

EXECUTIVE COMMITTEE MEETING.

MAY 9, 10 and 11, 1905.

Committee met on call of President with all members present.

The Committee called on Col. Thomas of the 11th U. S. Cavalry, and arrangements were made for the appearance of the Eight troops and Band now stationed at the Fort to attend the Fair on Tuesday and Friday, Aug. 29th and Sept. 1, 1905.

Secretary was instructed to have insurance placed on the Agricultural building, $10,000 fire and $20,000 wind, if same could be written that way, if not to plaec $15,000 combined.

Plans for an entrance at Grand Avenue were talked over with the architect who was requested to submit sketches for gate and fence not to exceed the sum of $1500.00, and when same were received Secretary was instructed to correspond with the members of the Board regarding the advisability of building the entrance, the cost not to exceed $1500.

The Secretary and Superintendent of Grounds were instructed to proceed with the construction of a combined curb and gutter along th north side of Grand Avenue to the amount of $1000.00

Secretary and Superintendent of Grounds were instructed to make such changes in the Agricultural Building interior that would make the best arrangements for installing the cases, tables etc., recently purchased for that building. Also to have an estimate made for building a music stand over the doors at the main east entrance; and if cost would not exceed $400.00 to have same built.

Secretary was instructed to have such alteration made in the Dining Hall, (formerly the Dairy building), which in his opinion will be necessary to comply with the agreement with Mr. McCray.

The Committee spent Thursday in a conference with the daily newspapers of the city regarding the advisability of buying advertising space in their papers.

The Committee, with Mr. Ellyson and Mr. Olson, met with a committee of business men at the Commercial Club at lunch on Wednesday and asked on behalf of the Iowa State Fair that the business men of the city close their places of business one half day. The Committee also met with the Des Moines Clearing House Association at 3:30 on Wednesday and made the same request, which was granted.

J. C. SIMPSON,
Secretary.

EXECUTIVE COMMITTEE MEETING.

JUNE 8-9, 1905.

Committee met with all members present. On motion contract for erection of the band stand in the Agricultural building and brick and stone work on the Grand Avenue was let to Chas. Weitz' Sons, at their bid of $1,050.00, same to be built according to the plans and specifications furnished by Smith & Wetherell. Motion also covered letting of contract to the Des Moines Bridge Iron Co., at $400.00 for the iron gates at the Grand Avenue entrance.

On motion the Government Indian Band from the government school at Chillocco, Oklahoma, Lem H. Wiley, Director was employed to furnish music at the Iowa State Fair for five (5) days, not to exceed seven (7) hours per day, at $700.00.

Secretary was authorized to confer with the Chief of the Des Moines Fire Department, Wm. Burnett, and arrange for firemens' races between the two Des Moines fire teams, Jack and Jack and Black and Tan, for a purse of not to exceed $300.00.

Secretary was authorized to correspond with Prof. C. F. Curtiss of Ames, Iowa, in regard to arrangement for exhibition of the Pabst and Swift six-horse teams at the Iowa State Fair.

Superintendent of Grounds was instructed to install the turnstiles at all the entrances.

On motion the committee adjourned.

J. C. SIMPSON,
Secretary.

MEETING OF EXECUTIVE COMMITTEE.

THURSDAY AND FRIDAY, JUNE 29 and 30, 1905.

Committee met on call of President with all members present

Secretary presented a letter from the Captain of the Rock Island Fire Drill Team of Valley Junction in regard to their giving a drill at the State Fair on Tuesday, August 29th. It was agreed by the Committee to give the members of the team admission to the grounds and Grand-stand on the afternoon of Tuesday, August 29th, and $25.00 in cash in lieu of the payment of any expenses, providing the Rock Island shops and stores of Valley Junction would close on this day; the team to appear on the grounds in full uniform and give a drill sometime between 11 and 11:30 o'clock A. M., the exact time to be selected by the Committee on the above date.

It was moved that for the purpose of advertising the dates for the closing of entries in the cattle and horse departments at the State Fair the following advertisements be printed:

2 pages in the Iowa Homestead.
2 pages in Wallace's Farmer.
1 page in Farmer's Tribune, Sioux City, Iowa.
¼ page in Breeder's Gazette.
Motion prevailed.

$300 was appropriated for the purpose of paying expenses of having a series of races between the fire teams Jack and Jack and Black and Tan; program to be arranged by the Secretary and Fire Chief Burnett, it being understood that the races were to take place on Monday, Wednesday, and Friday of Fair week.

It was moved that if the same would be satisfactory to

Superintendent St. John, the old poultry building be used for the foreign agricultural exhibits, to be designated as Foreign Exhibits Building.

J. C. SIMPSON,
Secretary.

EXECUTIVE COMMITTEE MEETING.

FRIDAY AND SATURDAY, AUG. 4th and 5th.

Committee met on call of president, with all members present

The secretary presented communication from F. W. Bicknell, proprietor of the Mail and Times, in regard to some advertising for the State Fair, and committee authorized secretary to accept proposition as presented in Mr. Bicknell's letter, not to exceed $25.00.

Communication from the Girls Band of Hamburg, Iowa, was presented, and secretary was instructed to write the manager thereof that the committee had already engaged sufficient music for the Iowa State Fair.

The committee, with Gov. Packard, visited the grounds, looking into the matter of providing additional barn room for cattle. It was decided to build an addition to the building formerly used for the poultry show, sufficient to place therein four rows of stalls. It was further agreed that a tent 90x120 should be secured to provide stall room for the balance, and secretary and the superintendent of grounds were instructed to see that the same was provided.

It was agreed to build a sixteen foot addition to the north end of the secretary's office, and secretary was instructed to see that same was completed in time for the fair.

J. C. SIMPSON,
Secretary.

MEETING OF THE STATE BOARD OF AGRICULTURE.

AT

STATE FAIR GROUNDS.

September 1, 1905.

Board met at President's office, at 10 o'clock A. M., with the following members present: Morrow, Cameron, Simpson, Johnston, Brown, Packard, Legoe, Wragg, Ledgerwood, Olson and Pike.

The President stated the purpose of the meeting was to pass upon the pay rolls of the several departments, and any other business which might come before them.

The following pay rolls were presented, and on motion allowed:

Swine Department, $94.00 Presented by R. S. Johnston.
Ticket Department, $194.35 Presented by Secretary.
Privilege Department $140.16 Presented by W. C. Brown.
Agricultural Department, $282.45 Presented by D. F. Sheehan.
Exposition and Art Building, $404.85 Presented by T. C. Legoe.
Cattle Department, $398.01 Presented by S. B. Packard.
Horticultural Department, $160.00 Presented by M. J. Wragg.
Treasury Department, $688.30 Presented by G. D. Ellyson.
Machinery Department. $162.85 Presented by John Ledgerwood.
Sheep and Poultry Department, $153.05 Presented by H. L. Pike.
Speed Department, $213.60 Presented by C. E. Cameron.
Dairy Department, $216.10 Presented by H. R. Wright.
President's Department, $16.00 Presented by W. W. Morrow.
Press Bureau, $164.70 Presented by Secretary.
Grounds, $102.70 Presented by J. H. Deemer, Supt.
Secretary's Department, $405.25 Presented by J. C. Simpson.
Forage Department, $293.75 Presented by J. C. Simpson.
Gate Department, $923.43 Presented by O. A. Olson.

Pay roll of the Police Department was referred to the Executive Committee.

G. H. White of Emerson, Iowa, appeared before the board and entered protest against the change of award on the "Best ten ears of corn" from the southern district. On motion it was decided that the first award made on the best ten ears of corn from the southern distrct should stand.

On motion the board adjourned to meet at the Presidents' office at nine o'clock A. M., Saturday, September 2nd.

J. C. SIMPSON,
Secretary.

MEETING OF THE STATE BOARD OF AGRICULTURE.

SATURDAY MORNING, SEPTEMBER, 2, 1905.

Board met at President's office, State Fair Grounds, at nine o'clock A. M.

Meeting was called to order by the President and on roll call the following members were found to be present: Morrow, Cameron, Simpson, Johnston, Brown, Packard, Wragg, Olson, Pike, McDonald and Legoe.

Secretary read communication from J. W. Jones, judge in the Agricultural Department, in regard to change of awards on the best ten ears of corn from the southern district. The Board refused to reconsider their action of Sept. 1st, regarding this award.

Mr. Wragg offered the following resolution in regard to the death of Benjamin F. Elbert and moved its adoption:

RESOLUTIONS ON THE DEATH OF FORMER MEMBER OF STATE BOARD.

BENJAMIN F. ELBERT.

"Benjamin F. Elbert was born in Van Buren county, Iowa, on the 8th day of May 1844. He attended school at the Northwestern University at Evanston, Ill. When the war broke out in 1861, Mr. Elbert, a mere boy, left school and joined the army in defense of his country. At the close of the war he returned to Iowa, and for twenty years engaged in the banking business at Albia, Iowa. Since 1886 he has been a resident of Des Moines, Iowa, and has been engaged extensively in the grain and stock business. He came to his death by accidental drowning near the city of Des Moines on the 23rd day of August, 1905.

Mr. Elbert was one of the most widely known men in the state. He was ever interested in the progress and upbuilding of the state, and especially was he interested in its agricultural growth. He was a member of the Iowa State Agricultural Society for a number of years and was ever interested in its success. After retiring from the Board, his judgment and experience was often sought by the members of the Board, and he was always found able and willing to furnish valuable assistance. As a business man he was courteous and gentlemanly in all his dealings, and his word was accepted equally with his bond. Iowa has produced but few men of his type; always kind and considerate of the interests of others, ever ready to oblige and accomodate a friend, and in his home an ideal husband and father. All who knew him loved and trusted him. It seems that such a life should be prolonged, but an All Wise Providence has seen proper to cut it off when the real pleasure of life seemed to be his. His numerous friends throughout the state will, with great pleasure, remember his many kindnesses and will with deep sorrow mourn his death." Be it therefore

Resolved, By the Iowa State Board of Agriculture that in the death of Benjamin F. Elbert the State of Iowa has lost one of its best and most useful citizens; that this Society has lost a true and valuable friend and supporter.

Resolved, Further that these resolutions be spread upon the records of this society and that a copy thereof be sent to the bereaved family with an expression of our deep sympathy."

The Resolution was unanimously adopted.

Mr. Wragg presented bill for $6.20 and on motion same was allowed.

Mr. McDonald presented pay roll as Superintendent of Horse Department; on motion same was allowed.

Secretary presented protest filed by Mr. F. W. Tutin of Des Moines, Iowa, in regard to award in saddle horse class, No. 5, and on motion it was decided that the award of the judge in Class No. 5, premium No. 126, be sustained.

On motion of Mr. Cameron, Secretary was authorized to issue a warrant in the name of Mrs. J. W. Essex for $20.00; her husband, J. W. Essex, being one of the special State Fair policemen, and who was killed in this city on Saturday night, August 26, 1905.

Mr. Packard moved that the committee on per diem and mileage be appointed; motion prevailed. The President appointed as such committee Legoe, Pike and Olson, who reported as follows.

	Days	Rate	Amt.	Miles	Amt.	Total
W. W. Morrow	19	$ 4.00	$ 76.00	82	$ 8.20	$ 84.20
C. E. Cameron	16	4.00	64.00	140	14.00	78.00
R. S. Johnston	18	4.00	72.00	158	15.80	87.80
C. W. Phillips	20	4.00	80.00			80.00
W. C. Brown	34	4.00	136.00	102	10.20	146.20
S. B. Packard	17	4.00	68.00	58	5.80	73.80
T. C. Legoe	20	4.00	80.00	100	10.00	90.00
M. J. Wragg	20	4.00	80.00	16	1.60	81.60
John Ledgerwood	23	4.00	92.00	87	8.70	100.70
M. McDonald	19	4.00	76.00	65	6.50	82.50
O. A. Olson	19	4.00	76.00	155	15.50	91.50
H. L. Pike	19	4.00	76.00	200	20.00	96.00
J. C. Simpson					For board	25.00
						$ 1117.30

H. L. PIKE
O. A. OLSON,
T. C. LEGOE,
Committee.

On motion the report of the committee on per diem and mileage was adopted and Secretary authorized to issue warrants in payment thereof.

In the matter of purchasing a litter carrier from the Louden Machinery Co., in Barn No. 12, same was referred to the Executive Committee with power to act.

Mr. Legoe introduced the following resolution and moved its adoption, which motion prevailed.

RESOLUTION.

"We the members of the State Board of Agriculture, other than the Executive Committee, hereby wish to express our appreciation of the great work done by our Executive Committee, Mr. Morrow, Mr. Cameron and Mr. Simpson, for the Iowa State Fair, and we feel that the great strides made by this institution in the past few years has been largely due to their management, good judgment and untiring efforts in carrying out the work delegated to them by this Board; And

Whereas, Our esteemed President had expected to retire from this Board after this year; and whereas we feel it would be a detriment to the Great Iowa State Fair, which has now reached the front rank of such institutions, to dispense with his valuable services for at least another year:

We therefore urge him to allow his name to again be presented at the next annual meeting for re-election; and we pledge him our undivided support, knowing as we do the great value of his experience and untiring fidelity in the unbuilding of the Iowa State Fair."

On motion Board adjourned.

J. C. SIMPSON,
Secretary.

Meeting of Executive Committee.

September 19-20-21, 1905.

Meeting was called by the President for purpose of disposing of business needing attention since close of fair. All members present.

Mr. Johnston and the Secretary were authorized to visit St. Louis, Lexington, Columbus and Springfield on an inspection of hog barns and ampitheatres.

Auditing Committee Meeting.

September 19-20-21, 1905.

Committee met on days above mentioned, with all members present as follows: C. W. Phillips, W. C. Brown, John Ledgerwood.

All claims on file were duly passed upon and the Secretary authorized to issue warrants in payment thereof.

JOHN R. SAGE, Director.

PART II.

REPORT OF THE IOWA WEATHER AND CROP SERVICE FOR 1905.

JOHN R. SAGE, DIRECTOR

CLIMATOLOGY OF THE YEAR 1905.

BAROMETER.—The mean pressure for the year was 30.04 inches. The highest observed pressure was 31.09 inches on January 25th, at Sioux City; lowest pressure, 29.12 inches on January 1st at Keokuk. Range for the state, 1.97 inches.

TEMPERATURE.—The mean temperature for the state was 47.3°, which is 0.4° below normal. The highest temperature reported was 104° on August 11th at Waukee. The lowest temperature reported was 41° below zero on Feb. 2nd, at Galva and Ida Grove. Range for the year 145°.

PRECIPITATION.—The average amount of rain and melted snow for the year, as shown by complete records of 107 stations, was 36.51 inches, which is 4.79 inches above the normal, and 7.77 inches above the average amount in 1904. The greatest amount recorded at any station for the year was 52.26 inches at Thurman. Least amount recorded 24.66 inches at Little Sioux. The greatest monthly rainfall was 14.89 inches at Keosauqua in June; least monthly amount, trace at Estherville, Rock Rapids in December. The greatest amount in any 24 consecutive hours was 12.10 inches, at Bonaparte, June 10th. The average number of days on which .01 of an inch or more of rain fell was 97.

WIND AND WEATHER.—The prevailing direction of wind was Northwest. Highest velocity reported, 59 miles an hour, in Sioux City, from the Northwest on May 3rd. Average daily movement, 201 miles. There were 164 clear days, 98 partly cloudy, and 103 cloudy days; as against 164 clear days, 97 partly cloudy, and 105 cloudy days in 1904.

MONTHLY SUMMARIES.

JANUARY.—The monthly mean temperature for the state, as shown by records of 118 stations, was 11.2°, which is 7.0° below normal. By sections the mean temperatures were as follows: Northern section 7.7°, which is 9.7° below normal; central section 11.2°, which is 7.3° below normal; southern section 14.6°, which is 8.2° below normal. The highest monthy mean was 19.6°, at Keokuk; lowest monthly mean, 4.2°, at Fayette. The highest temperature reported was 56°, at Keokuk on the 1st; lowest temperature reported was 30°, at Inwood, on the 25th. The average monthy maximum was 43.8°; average monthly minimum, 18.9°. Greatest daily range, 48° at Audubon; average of greatest daily ranges, 35.4°. Average precipitation for the state, as shown by record of 125 stations, was .91 of an inch, which is .06 of an inch below normal. The averages by sections were as follows: Northern section, .70 inch, which is .11 inch below normal; central section, 1.07 inches, which is .04 inch below normal; southern section .97 inch, which is .09 inch below normal. The largest amount reported was 1.82 inch, at Lacoma, the least amount reported, .12 inch, at Storm Lake. The greatest daily rainfall reported was .90 inch, at Lacoma, Ridgeway, Northwood, on the 11th and 12th respectively. Average number of days on which .01 of an inch or more was reported, 6. Prevailing direction of the wind, northwest; highest velocity reported, 38 miles per hour, from the Northwest, at Sioux City, on the 5th. Average number of clear days, 13; partly cloudy, 8; cloudy, 10.

February.—The monthly mean temperature for the state, as shown by records of 115 stations, was 12.8°, which is 6.8° below normal. By sections the mean temperatures were as follows: Northern section 10.6°, which is 5.9° below normal; central section 12.7°, which is 7.6° below normal; southern section 15.1°, which is 6.4° below normal. The highest monthly mean was 18.0° at Keokuk; lowest monthly mean, 8.1° at Forest City. The highest temperature reported was 69° at Glenwood and Onawa on the 28th; lowest temperature reported, 41° below zero at Galva and Ida Grove on the 2d. The average monthly maximum was 57.2°; average monthly minimum—30.6°. Greatest daily range 57° at Sibley; average of greatest daily ranges, 40.0°. Average precipitation for the state, as shown by records of 125 stations, was 1.57 inches which is 0.53 of an inch above normal. The averages by sections were as follows: Northern section, 1.35 inches, which is .46 of an inch above normal; central section, 1.68 inches, which is 0.62 of an inch above normal; southern section, 1.67 inches, which is 0.53 of an inch above normal. The largest amount reported was 2.97 inches at Belle Plaine; least amount reported, 0.44 of an inch, at Sioux City. The greatest daily rainfall reported was 1.10 inches at Ottumwa, on the 24th. Average number of days on which .01 of an inch or more was reported, 7. Prevailing direction of the wind northwest; highest velocity reported, 49 miles per hour, from the northwest, at Sioux City, on the 14th. Average number of clear days, 14; partly cloudy, 7; cloudy, 7.

March.—The monthly mean temperature for the state, as shown by records of 122 stations, was 41.5 degrees, which is 9.1° above normal. By sections, the mean temperatures were as follows; Northern section 38.3°, which is 8.7° above normal; central section 41.3°, which is 9.1° above normal; southern section 44.9°, which is 9.0° above normal. The highest monthy mean was 47.2° at College Springs and Sidney; lowest monthly mean, 35.9° at Cresco The highest temperature reported was 84° at Onawa on the 27th; lowest temperature reported 1°, at Fayette, Grand Meadow, Osage and Ridgeway on the 11th. The average monthly maximum was 75.6°; average monthly minimum, 19.5°. Greatest daily range, 58°, at Iowa City; average of greatest daily ranges, 38.2°. Average precipitation for the state, as shown by records of 132 stations, was 2.04 inches, which is .20 of an inch above normal. The averages by sections were as follows: Northern section, 1.97 inches, which is .31 of an inch above normal; central section, 2.23 inches, which is .35 of an inch above normal; southern section, 1.93 inches, which is .04 of an inch below normal. The largest amount reported was 3.70 inches at Inwood; least amount reported, .39 of an inch, at Glenwood. The greatest daily rainfall reported was 3.00 inches at Inwood on the 18th. Average number of days on which .01 of an inch or more was reported, 8. Prevailing direction of the wind, south; highest velocity reported, 52 miles per hour, from the south, at Sioux City, on the 27th. Average number of clear days, 8; partly cloudy, 8; cloudy, 15.

APRIL.—The monthly mean temperature of the state as shown by records of 123 stations, was 47.5°, which is 1.8° below normal. By sections the mean temperatures were as follows: Northen section, 45.3°, which is 2.0° below normal; central station, 47.5°, which is 1.3° below normal; southern section, 60.4°, which is 1.6° below normal. The highest monthly mean was 52.6° at Keokuk; lowest monthly mean, 42.9° at Sibley. The highest temperature reported was 90°, at Clarinda on the 9th; lowest temperature reported, 10°, at Inwood and Sibley on the 14th. The average monthly maximum was 79.3°; average monthly minimum, 19.5°. Greatest daily range, 58°, at Iowa City; average of greatest daily ranges, 40.7°. Average precipitation for the state, as shown by records of 135 stations, was 3.03 inches, which is 0.14 of an inch above normal. The averages by sections were as follows: Northern section, 2.09 inches, which is 0.53 of an inch below normal; central section, 3.07 inches, which is 0.17 of an inch above normal; southern section, 3.94 inches, which is 0.83 of an inch above normal. The largest amount reported was 5.49 inches at Leon; least amount reported, 0.63 of an inch, at Sibley. The greatest daily rainfall reported was 3.25 inches at Ottumwa on the 20th. Average number of days on which .01 of an inch or more was reported, 8. Prevailing direction of the wind, northwest; highest velocity reported, 54 miles per hour, from the north, at Sioux City, on the 3d. Average number of clear days, 12; partly cloudy, 8; cloudy, 10.

MAY.—The monthly mean temperature for the State, as shown by records of 123 stations, was 58.3°, which is 2.1° below normal. By sections the mean temperatures were as follows: Northern section, 56.0°, which is 3.3° below normal; central section, 58.6°, which is 1.6° below normal; southern section, 60.4°, which is 1.6° below normal. The highest monthly mean was 63.6°, at Keokuk; lowest monthly mean, 53.2°, at Sibley. The highest temperature reported was 88°, at Glenwood and Welton Junction on the 3d and 29th; lowest temperature reported, 28°, at Washta on the 26th. The average monthly maximum was 82.2°; average monthly minimum, 34.3°. Greatest daily range, 49°, at Carroll; average of greatest daily ranges, 36.9°. Average precipitation for the state, as shown by the records of 132 stations, was 5.95 inches, which is 1.82 inches above normal. The averages by sections were as follows: Northern section, 7.60 inches, which is 3.68 inches above normal; central section, 5.88 inches, which is 1.79 inches above normal; southern section, 4.38 inches, which is .03 of an inch above normal. The largest amount reported was 10.83 inches at Hanlontown; least amount reported, 2.57 inches at Bonaparte. The greatest daily rainfall reported was 3.48 inches at Onawa on the 11th. Average number of days on which .01 of an inch or more was reported, 14. Prevailing direction of the wind, northwest; highest velocity reported, 59 miles per hour, from the south, at Sioux City, on the 3rd. Average number of clear days, 12; partly cloudy, 11; cloudy, 8.

JUNE.—The monthly mean temperature for the state, as shown by records of 121 stations, was 68.9°, which is 0.3° above normal. By sections the mean temperatures were as follows: Northern section, 67.9°, which is 0.2° below normal; central section, 70.2°, which is 0.7° above normal; southern section, 71.7°, which is 0.5° above normal. The highest monthly mean was 74.5° at Red Oak; lowest monthly mean, 64.5° at Sibley. The highest temperature reported was 100° at Red Oak on the 9th; lowest temperature reported, 36°, at Washta on the 22d. The average monthly maximum was 92.1°; average monthly minimum, 45.7°. Greatest daily range, 48° at Washta; average of greatest daily ranges, 33.9°. Average precipitation for the state, as shown by records of 131 stations, was 5.53 inches, which is 1.00 inch above normal. The averages by sections were as follows: Northen section, 5.39 inches which is .71 of an inch above normal; central section, 4.78 inches, which is .22 of an inch above normal; southern section, 6.43 inches, which is 2.07 inches above normal. The largest amount reported was 14.89 inches at Keosauqua; least amount reported, 1.80 inches at Forest City. The greatest daily rainfall reported was 12.10 inches at Bonaparte on the 10th. Average number of days on which .01 of an inch or more was reported, 10. Prevailing direction of the wind, south, southeast, southwest; highest velocity reported, 49 miles per hour, from the northwest, at Sioux City, on the 18th. Average number of clear days, 12; partly cloudy, 11; cloudy, 7.

JULY.—The monthly mean temperature for the state, as shown by records of 117 stations, was 70.6 degrees, which is 3.8° below normal. By sections the mean temperatures were as follows: Northern section, 69.5°, which is 3.7° below normal; central section, 70.8°, which is 3.5° below normal; southern section, 71.4°, which is 4.3° below normal. The highest monthly mean was 73.4°, at Keokuk; lowest monthly mean.

67.4°, at Sibley. The highest temperature reported was 102°, at Waukee, on the 16th; lowest temperature reported, 40°, at Washta, on the 25th. The average monthly maximum was 95.3°; average monthly minimum, 49.0°. The greatest daily range, 41°, at Waukee; average of greatest daily ranges, 31.6°. Average precipitation for the state, as shown by records of 128 stations, was 2.91 inches, which is 1.44 inches below normal. The averages by section were as follows: Northern section, 2.00 inches, which is 2.21 inches below normal; central section, 3.19 inches, which is 1.09 inches below normal; southern section, 3.54 inches, which is 1.08 inches below normal. The largest amount reported was 7.08 inches at Albia; least amount reported, 0.69 of an inch at Washta. The greatest daily rainfall reported was 4.00 inches, at Grinnell, on the 19th. Average number of days on which .01 of an inch or more was reported, 9. Prevailing direction of the wind, northwest; highest velocity reported, 39 miles per hour, from the northwest, at Sioux City, on the 4th. Average number of clear days, 14; partly cloudy, 10; cloudy, 7.

August—The monthly mean temperature for the state, as shown by records of 125 stations, was 74.3°, which is 2.3° above normal. By sections the mean temperatures were as follows: Northern section, 73.1°, which is 24° above normal; central section 74.4°, which is 2.8° above normal; southern section 75.4°, which is 1.8° above normal. The highest monthly mean was 78.0° at Waukee; lowest monthly mean, 70.6° at Fayette. The highest temperature reported was 104°, at Waukee, on the 11th; lowest temperature reported 44°, at Rock Rapids, on the 6th. The average monthly maximum was 95.5°; average monthly minimum, 52.9°. Greatest daily range, 46° at Rock Rapids; average of greatest daily ranges, 33.1°. Average precipitation for the state, as shown by records of 136 stations, was 4.05 inches, which is 0.50 of an inch above normal. The averages by sections were as follows: Northern section, 4.06 inches, which is 0.96 of an inch above normal; central section, 3.48 inches, which is 0.24 of an inch below normal; southern section, 4.61 inches, which is 0.71 of an inch above normal. The largest amount reported was 8.47 inches at Plover; least amount reported, 1.04 inches at Vinton. The greatest daily rainfall reported was 3.74 inches at Allerton, on the 14th. Average number of days on which .01 of an inch or more was reported, 9. Prevailing direction of the wind, south; highest velocity reported, 48 miles per hour, from the northeast, at Sioux City, on the 20th. Average number of clear days, 16; partly cloudy, 9; cloudy, 6.

September—The monthly mean temperature for the state, as shown by records of 124 stations, was 65.8°, which is 2° above normal. By sections the mean temperatures were as follows: Northern section, 64.2°, which is 1.9° above normal; central section, 65.8°, which is 2.5° above normal; southern section, 67.3°, which is 1.5° above normal. The highest monthly mean was 69.2°, at Red Oak; lowest monthly mean, [illegible]°, at Hanlontown. The highest temperature reported was 96°, at Mount Ayr and Ottumwa, on the 1st; lowest temperature reported, 36° at Washta, on the 4th. The average monthly maximum was 88.0°;

average monthly minimum, 44.0°. Greatest daily range, 48°, at Massena; average of greatest daily ranges, 34.1°. Average precipitation for the state, as shown by records of 130 stations, was 3.81 inches, which is .50 of an inch above normal. The averages by sections were as follows: Northern section, 3.23 inches, which is .16 of an inch below normal; central section, 3.08 inches, which is .17 of an inch below normal; southern section, 5.11 inches, which is 1.81 inches above normal. The largest amount reported was 13.18 inches at Thurman; least amount reported, .50 of an inch, at Clear Lake. The greatest daily rainfall reported was 6.10 inches at Alta on the 18th. Average number of days on which .01 of an inch or more was reported, 8. Prevailing direction of the wind, southeast; highest velocity reported, 50 miles per hour, from the southeast, at Sioux City, on the 15th. Average number of clear days, 14; partly cloudy, 8; cloudy, 8.

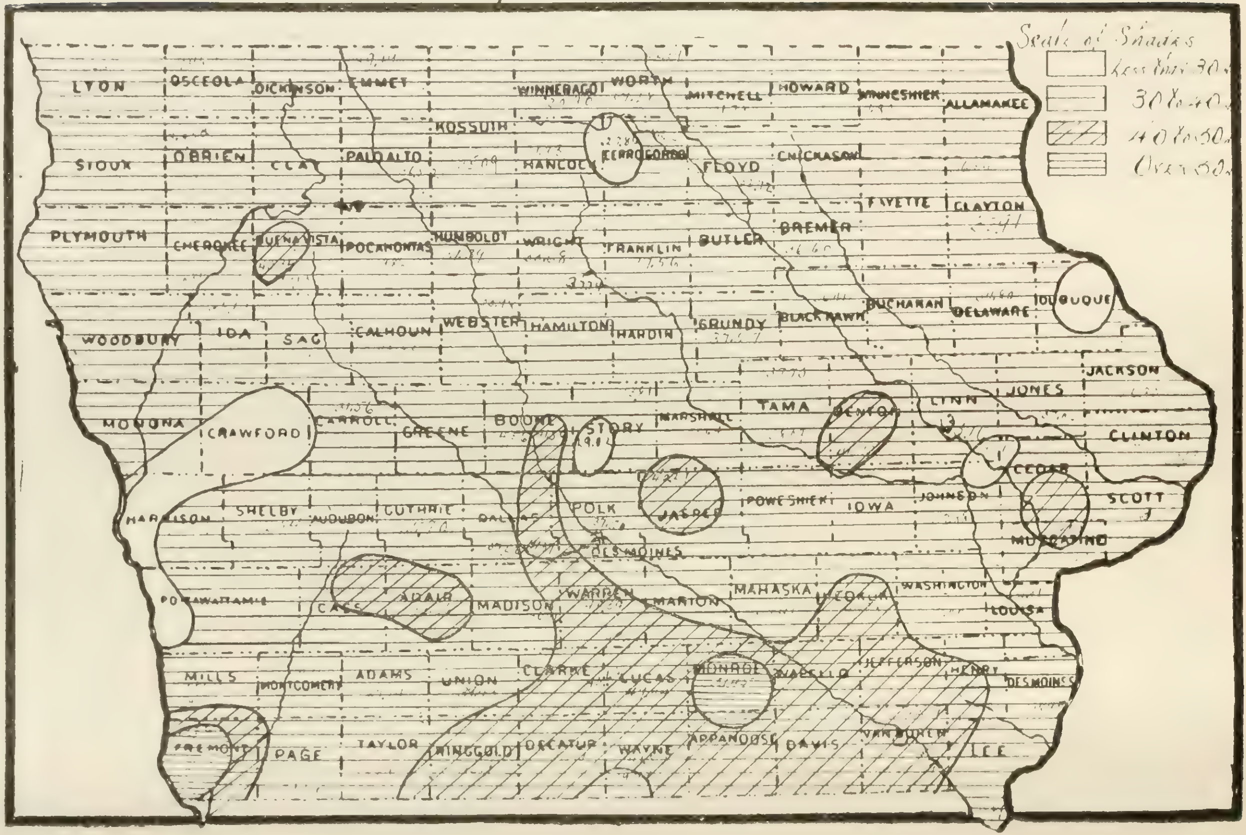
OCTOBER—The monthly mean temperature for the state, as shown by records of 116 stations, was 49.2° degrees, which is 3.3° below normal. By sections the mean temperatures were as follows: Northern section, 46.9°, which is 4.0° below normal; central section, 49.5°, which is 2.3° below normal; southern section, 51.1° degrees, which is 3.6° below normal. The highest monthly mean was 54.8°, at Keokuk; lowest monthly mean, 42.4°, at New Hampton. The highest temperature reported was 95°, at Inwood and Sheldon, on the 4th; lowest temperature reported, 16°, at Decorah, Elkader, Maquoketa and Inwood, on the 28th, 29th and 30th. The average monthly maximum was 84.7°; average monthly minimum, 20.4°. Greatest daily range, 53°, at Keosauqua; average of greatest daily ranges, 38.7°. Average precipitation for the state, as shown by records of 125 stations, was 3.40 inches, which is 0.98 of an inch above normal. The averages by sections were as follows: Northern section, 3.15 inches, which is .96 of an inch above normal; central section, 3.58 inches, which is 1.13 inches above normal; southern section, 3.46 inches, which is .85 of an inch above normal. The largest amount reported was 5.36 inches at Iowa City; least amount reported, 1.20 inches, at Sioux Center. The greatest daily rainfall reported was 3.14 inches at Clinton on the 16th and 17th. Average number of days on which .01 of an inch or more was reported, 8. Prevailing direction of the wind, northwest; highest velocity reported, 47 miles per hour, from the south, at Sioux City, on the 8th. Average number of clear days, 16; partly cloudy, 6; cloudy, 9.

NOVEMBER—The monthly mean temperature for the state, as shown by records of 123 stations, was 38.4°, which is 3.2° above normal. By sections the mean temperatures were as follows: Northern section 36.7°, which is 4.1° above normal; central section 38.3°, which is 3.3° above normal; southern section 40.3°, which is 2.3° above normal. The highest monthly mean was 42.8°, at Red Oak; lowest monthly mean, 35.2°, at Sibley. The highest temperature reported was 70°, at Belle Plaine, Webster City, Burlington and Corning, on the 4th, 12th, 13th and 17th; lowest temperature reported .12°, at Estherville on the 30th. The average monthly maximum was 63.2°; average monthly minimum, 0.6°.

Greatest daily range, 54°, at Massena; average of greatest daily ranges, 34.3°. Average precipitation for the state, as shown by records of 131 stations, was 2.84 inches, which is 1.53 inches above normal. The averages by sections were as follows: Northern section, 3.16 inches, which is 1.91 inches above normal; central section, 2.67 inches, which is 1.26 inches above normal; southern section, 2.58 inches, which is 1.40 inches above normal. The largest amount reported was 5.30 inches at Plover; least amount reported, .90 inch at Mt. Vernon. The greatest daily rainfall reported was 2.70 inches at Ft. Madison on the 23d. Prevailing direction of the wind, northwest; highest velocity reported, 54 miles per hour from the northwest, at Sioux City, on the 24th. Average number of clear days, 16; partly cloudy, 7; cloudy, 7.

December—The monthly mean temperature for the state, as shown by records of 117 stations, was 27.0°, which is 4.0° above normal. By sections the mean temperatures were as follows: Northern section 25.2°, which is 5.0° above normal; central section 26.9°, which is 3.8° above normal; southern section 28.9°, which is 3.3° above normal. The highest monthly mean was 32.4°, at Red Oak; lowest monthly mean, 22.8°, at Charles City. The highest temperature reported was 62°, at Jefferson on the 8th; lowest temperature reported was 11°, at Monticello on the 23d and 24th. The average monthly maximum was 52.0°; average monthly minimum, 3.1°. Greatest daily range, 53°, at De Soto; average of greatest daily ranges, 36.0°. Average precipitation for the state, as shown by records of 125 stations, was 0.52 inch, which is 0.73 of an inch below normal. The averages by sections were as follows: Northern section, .40 inch, which is 0.65 inch below normal; central section, 0.63 inch, which is 0.71 inch below normal; southern section, 0.53 inch, which is 0.84 inch below normal. The largest amount reported was 1.69 inches at Ottumwa; least amount reported, trace, at Estherville and Rock Rapids. The greatest daily rainfall reported was 1.27 inches at Ottumwa on the 28th. Average number of days on which .01 of an inch or more was reported, 3. Prevailing direction of the wind, northwest; highest velocity reported, 37 miles per hour, from the northwest, at Sioux City on the 8th. Average number of clear days, 19; partly cloudy, 6; cloudy, 6.

Annual Precipitation Chart 1905.


Scale of Shades
Less than 30
30 to 40
40 to 50
Over 50
LYON
OSCEOLA
DICKINSON
EMMET
KOSSUTH
WINNEBAGO
WORTH
MITCHELL
HOWARD
WINNESHIEK
ALLAMAKEE
SIOUX
OBRIEN
CLAY
PALO ALTO
HANCOCK
CERRO GORDO
FLOYD
CHICKASAW
FAYETTE
CLAYTON
PLYMOUTH
CHEROKEE
BUENA VISTA
POCAHONTAS
HUMBOLDT
WRIGHT
FRANKLIN
BUTLER
BREMER
BUCHANAN
DELAWARE
DUBUQUE
WOODBURY
IDA
SAC
CALHOUN
WEBSTER
HAMILTON
HARDIN
GRUNDY
BLACK HAWK
JACKSON
JONES
LINN
TAMA
BENTON
MONONA
CRAWFORD
CARROLL
GREENE
BOONE
STORY
MARSHALL
CLINTON
CEDAR
SCOTT
HARRISON
SHELBY
AUDUBON
GUTHRIE
DALLAS
POLK
JASPER
POWESHIEK
IOWA
JOHNSON
MUSCATINE
DES MOINES
POTTAWATTAMIE
CASS
ADAIR
MADISON
WARREN
MARION
MAHASKA
KEOKUK
WASHINGTON
LOUISA
MILLS
MONTGOMERY
ADAMS
UNION
CLARKE
LUCAS
MONROE
WAPELLO
JEFFERSON
HENRY
DES MOINES
FREMONT
PAGE
TAYLOR
RINGGOLD
DECATUR
WAYNE
APPANOOSE
DAVIS
VAN BUREN
LEE

DATES OF KILLING FROST, 1905.

	Killing Frost.	
	Last in Spring	First in Autumn
Afton	April 18	October 12
Albia	April 19	October 12
Algona	May 26	October 11
Allerton	April 18	October 12
Alta	May 26	October 11
Alton		October 11
Amana	April 22	October 12
Ames	April 22	October 11
Atlantic	May 26	October 11
Audubon	May 26	October 11
Baxter	April 27	October 12
Bedford	April 22	October 11
Belle Plaine	April 22	October 12
Bonaparte	April 22	October 12
Boone	April 19	October 12
Britt	May 26	October 11
Burlington	April 18	October 12
Carroll	May 26	October 11
Cedar Rapids	April 19	October 12
Chariton	April 18	October 12
Charles City	April 30	October 11
Clarinda	April 22	October 11
Clear Lake	April 30	October 11
Clinton	April 22	October 12
Col. Springs	April 18	October 11
Col. Junction	April 18	October 12
Corning	April 21	October 12
Corydon	April 18	October 12
Cresco	April 30	October 11
Creston	April 19	October 12
Davenport	April 18	October 12
Decorah	April 22	October 11
Delaware	April 30	October 11
Denison	May 26	October 11
Des Moines	April 18	October 12
DeSoto	April 22	October 12
Dows	May 26	October 12
Dubuque	April 16	October 12
Earlham	May 26	October 12
Elkader	April 22	October 12
Elliott	May 5	October 11
Estherville	May 26	
Fayette	May 26	
Forest City	April 30	October 11
Fort Dodge	April 30	October 12
Galva	May 26	October 11
Glenwood	May 28	October 11
Grand Meadow	April 30	October 11
Greene	April 30	October 11
Greenfield	May 5	October 12
Grinnell	April 18	October 12
Grundy Center	April 30	October 12
Guthrie Center	April 30	October 12
Hampton	April 30	October 11
Hancock		October 12
Hanlontown	May 26	October 10
Harlan	May 26	October 11
Hopeville	April 18	October 12
Humboldt	May 26	October 12
Ida Grove	May 26	
Independence	April 30	October 12
Indianola	April 22	October 12
Inwood		October 10
Iowa City	April 22	October 11
Iowa Falls	April 30	October 12
Jefferson		October 12
Keokuk	April 17	October 12
Keosauqua	April 22	October 12
Knoxville	April 18	
Larrabee	May 26	October 12
LeMars	May 26	October 11
Lenox	April 18	October 11
Leon	April 18	October 12
Little Sioux	April 21	October 21
Logan	May 5	October 11
Maquoketa	April 23	October 12
Marshalltown	April 30	October 12
Mason City	April 30	October 11
Massena	April 18	
Monticello	May 26	October 11
Mt. Ayr	April 18	October 11
Mt. Pleasant	April 19	October 12
Mt. Vernon	April 18	October 12
New Hampton	April 30	October 11
Newton	April 18	October 12
Northwood	April 30	October 11
Odebolt	May 8	October 11
Ogden	April 30	October 12
Olin	April 22	October 12
Onawa	April 21	October 12
Osage	April 30	October 12
Oskaloosa	April 22	October 12
Ottumwa		October 12
Pac Junction	April 18	October 11
Pella		October 12
Perry	April 18	
Plover	May 26	October 12
Pocahontas	April 30	October 12
Red Oak	April 19	October 21
Ridgeway	April 21	October 11
Rock Rapids	May 8	October 18
Rockwell City	May 8	October 12
Sac City	May 12	
St. Charles	April 18	October 12
Sheldon	May 26	October 11
Sibley	May 26	October 12
Sidney	April 18	October 11
Sigourney	April 22	October 12
Sioux Center	May 8	October 11
Sioux City	April 24	October 20
Stockport	April 22	October 12
Storm Lake	April 26	October 11
Thurman	April 22	October 11
Tipton	April 18	October 12
Toledo	April 18	October 12
Vinton	April 28	
Washington	April 18	October 11
Wapello	April 18	
Washta	May 26	October 11
Waterloo	April 30	October 12
Waukee	April 18	October 12
Waverly	April 30	October 12
Webster City	May 26	
West Bend	May 8	October 12
Whitten	May 26	October 11
Wilton Junct	April 18	October 12
Winterset	April 18	October 12
Woodburn		October 12
Zearing	May 7	October 12

CLIMATE AND CROP REVIEW, 1905.

The mean temperature of the year 1905 was 47.3°, which is 0.4° below the normal. The daily average for the year was 1° above the mean of 1904. The average precipitation for the state, 36.51 inches, was 4.79 inches above normal, and 7.77 inches above the average in the preceding year.

January and February were colder than usual, the average for the former being 11.2°, and the latter 12.8°, or nearly 7° below normal. Considerable snow fell, and there was much stormy weather during those months. The fields generally were well covered by snow during the coldest periods, affording protection to winter grain and grasses.

The last week in February was generally moderate, and March was phenominally warm, the mean temperature for the month being 9.1° above normal. Springlike conditions were continuous, except about 6 days in the second decade. The frost disappeared and the surface dried off rapidly. Much preparatory work was done the first half of the month, and considerable seeding of spring wheat, oats and barley was done in the latter half. Winter wheat, rye and clover showed but little damage from effects of freezing, and fruit buds were apparently unharmed. The season for farm work and growth of vegetation was about a week earlier than the average.

April brought unusually variable temperature, the average for the state being 1.8° below normal. Severe frosts were reported in all districts in every week, causing apprehension for safety of fruit buds. In portions of the southern section excessive moisture retarded plowing and seeding, but in the central and northern districts there was little hindrance to field work. At the close of April the season was somewhat earlier than usual in respect to growth of grass and foliage, and more than the usual amount of plowing and other farm work had been done. And during the last three days of the month corn planting operations were in progress in favored localities. About the usual acreage of oats, spring wheat and barley was sown in April.

The temperature in May was 2.1° below normal, and the rainfall was 1.82 inches above the average. The larger portion of the excess of moisture fell in the northern half of the state, in the first and second decades of the month. Frosts were noted in all districts about the 5th and 26th, and at numerous stations the temperature fell to 32° or below; but the damage to vegetation was light. During the first week in May conditions were generally favorable for preparing the ground and planting corn on the best drained lands. The weather was wet, cool and backward from about the 7th to the 17th, causing delay in planting operations and retarding germination of seed in the ground. The balance of the month was variable, with some more than the average amount of moisture; but fair progress was made in planting, and cultivating the early planted fields. Wheat, oats, barley, rye, meadows and pastures made good growth in May. The average conditions of grain and grasses were nearly normal at the close of the month.

June was about normal in temperature, and the rainfall was 1 inch above the state average. The distribution of rainfall was very unequal, ranging from 1.80 inches at Forest City to 14.89 at Keosauqua. The greatest excess was recorded in the southeast district, and in the northwest counties. The first week was warm and mostly dry, affording ideal conditions for growth of crops and cultivation of corn and potatoes. Some corn planting was done, in localities previously too wet, as late as the 12th to 15th of the month. The rainfall on the 9th and 10th was excessively heavy and destructive in Van Buren and adjoining counties; but the copious showers in other parts of the state were timely and beneficial to all crops. The third week was normal in temperature and amount of sunshine, with conditions favorable for cleaning out the weedy fields, and general farm work. The month closed with a showery period of three to four days. Haying operations were begun somewhat earlier than usual, and the first cutting of clover suffered damage by the wet weather. The corn crop was doing fairly well in the larger part of the state at the end of the month.

The daily mean temperature of July was 3.8° below normal and the rainfall was 1.44 inches below the average of previous years. The first half of the month brought the bulk of the wet weather and conditions were more favorable during the latter half for harvest of hay and grain. The conditions were not altogether favorable in the early part of the month for finishing the cultivation of corn. The fields were not generally clean as could be desired when laid by. The warmest period was from about the 13th to 20th, during which corn made rapid advancement. Spring wheat, rye and barley ripened under favorable conditions and the work of harvesting was well advanced in the latter half of July. As a whole July was a favorable month. With but little damage from excess or deficiency of moisture. The crops of wheat, oats, barley and rye secured were better in quality and yield than was deemed possible in the early part of the season. At the close of the month corn gave promise of more than an average crop.

August was above normal in temperature and rainfall. The mean temperature, 74.3° was 2.3° above normal, and 3.7° degrees higher than the daily average in July. From the first week to the close of the month the temperature was near or above the normal line. The rainfall was generally timely, and not greatly in excess of local needs in any part of the state, the distribution being more than usually favorable. In the state the average number of clear days was 16, and 9 were partly cloudy, affording ample sunshine to hasten growth of all belated crops. At the close of the month the corn crop was generally in the full roasting ear stage or glazed, giving promise of reaching maturity in advance of the average date of killing frosts. Good progress was made during the month in threshing wheat, oats and barley; but in many localities these grains suffered some damage from exposure to showers while in the shock. There was a heavy growth of aftermath in meadows, and the pastures were about as green as in springtime. The potato crop suffered materially from blight. The corn crop was seriously damaged by root worms in fields that had been planted two or more seasons in succession.

September was about 2° above normal in temperature, with a small excess of rainfall. The coldest period of the month was the first decade and the warmest and brightest was the third decade. The distribution of rainfall was quite unequal, more than half the state receiving less that 3.00 inches, the heaviest amounts being recorded in portions of the southwest and northwest districts. During the stormy period from the 14th to the 18th severe windstorms swept over considerable areas in all districts, aggregating over one-third of the state. Corn was prostrated to an unusual extent, resulting in material damage in regions that were most severely stormswept. The extraordinary weather of the last decade was of inestimable value in bringing to maturity the late planted portion of the corn crop, affording ideal conditions for cutting fodder, threshing grain, putting up second crop of clover, aftermath and wild hay, fall plowing, etc. At the close of the month fully 98 per cent of corn was well matured. And most of the corn planted as late as June 15th was well ripened. An increased acreage of winter wheat was sown in September, and made an excellent stand. About the usual acreage of winter rye was sown.

The first decade of October was warm and generally dry and clear, with conditions favorable for ripening all belated crops, and drying out the corn crop preparatory to husking, which was in progress in the latter part of the month. The last decade was also very dry and clear, altogether the month of October was notable for its large percentage of sunshine and agreeable weather. The first killing frosts were reported about the 11th and 12th in all districts, after all crops were well matured. Pastures were green, affording excellent grazing throughout the month. All minor crops, garden truck and fruit were harvested in due season, under favorable conditions. Except some damage to flattened corn by wet weather from the 15th to 20th, the conditions during October were all that could be desired.

The average temperature in November was 3.2° above normal. There was a large excess of clear or partly cloudy weather, as compared with the average. Conditions were unusually favorable for gathering corn, and all kinds of field work usual to the season. The bulk of the corn crop was husked in good condition for cribbing or shipping. Pasturage was unusually good for grazing stock. Fall wheat and rye were looking well, and much fall plowing was in evidence in all parts of the state.

The closing month of the year was one of the fairest and most agreeable winter months ever known in this section. Altogether the crop season of 1905 will be remembered as one that contributed largely to the prosperity of the state and nation.

CROP REPORT, JUNE 1, 1905.

Following is a summary of the June 1st reports, received from county and township correspondents of the Iowa Weather and Crop Service.

CORN.—The reports showed an increase in the acreage in more than half the counties, and a slight decrease in some of the others wherein a portion of the acreage prepared for corn was too wet to plant prior to June 1st. The average increase for the State at planting appeared to be about three per cent.

The average condition of the corn crop was estimated ninety per cent. or about the same as last year on corresponding date. A considerable portion of the crop, however, was scarcely visible above ground on June 1st.

The other staple farm crops were rated as follows, in condition:

WINTER WHEAT.—102 per cent; spring wheat, 99; oats, 95; barley, 96; rye, 98; flax, 94; potatoes, 97; meadows, 100; pastures, 97.

CONDITION OF FRUIT.—Apples, 80 per cent; plums, 70; peaches, 35; cherries, 65; grapes, 90; strawberries, 103; raspberries, 96; blackberries, 94.

CONDITION OF LIVE STOCK.—Cattle, 100 per cent; sheep, 99; hogs, 99; spring pigs, 90; horses, 99; foals, 95.

The area of spring wheat was reduced probably 10 per cent below the area harvested last year. The oats acreage, about the same as last year. Barley acreage was reduced 7 to 10 per cent.

CROP CONDITIONS, JULY 1, 1905.

Reports of crop correspondents showed the following averages of staple crops, July 1, 1905: Winter wheat, 99; spring wheat, 94; corn, 92; oats, 96; rye, 96; barley, 98; flax, 95; hay crop, 101; pastures, 105; potatoes, 98; apples, 65; grapes, 88; plums, 68 per cent.

On July 1, 1904, spring wheat was rated 91; corn, 90; oats, 91; barley, 93; flax, 89; hay, 90; pastures, 94; potatoes, 101; apples, 85 per cent.

CROP CONDITIONS, AUGUST 1, 1905.

The August 1st report of crop correspondents showed following estimates of the condition of crops on the percentage basis: Corn, 94 per cent; spring wheat, 93; oats, 97; flax, 78; potatoes, 92; pastures, 103; apples, 40; grapes, 91.

Last year at corresponding date the estimates were: Corn, 88; spring wheat, 75; oats, 89; flax, 94; pastures, 96; potatoes, 101; apples, 73; grapes, 86.

IOWA CROPS, 1905.

FINAL REPORT FOR THE STATE. TOTAL YIELD; VALUE OF SOIL PRODUCTS AT FARM PRICES, DEC. 1, 1905.

The crop season of 1905, as shown by tabulated reports from each county, was the best that has been reported in this state since 1900. Altogether the showing as to the aggregate yield and prices of staple products was beyond the estimates made during the early half of the season.

CORN.—Reports showed unusual variation in the yield of corn, the averages by counties ranging from 25 to 45 bushels per acre, as a result of notable local differences in condition of the soil in the critical stages of the season. The first report of the season showed an average increase in the acreage of corn planted as compared with last year, but adverse local conditions in May and June caused a loss of acreage which was taken into account in the final estimate of the output. The census returns showed the total area of corn to have been 9,583,815 acres in 1904. The yield this year is based on a total of 9,285,150 acres, the average yield for the state being 37.2 bushels per acre. The total product appears to be 345,871,840 bushels, which is 816,800 bushels in excess of the output of any previous year; but the average per acre was higher in four previous seasons since 1890. The average value of the corn crop on Dec. 1 was about 35 cents per bushel—total for the state $121,055,144.

WHEAT.—The yield and quality of winter wheat has been good this season, but the acreage was small. The total appears to be 1,253,020 bushels, an average of 20.2 bushels per acre, and quality good. The total of spring wheat was 5,155,760 bushels—an average of 14.4 bushels per acre. The total wheat output (6,108,780 bushels) is worth $4,614,321—an average of 72 cents per bushel.

OATS.—The yield of oats 33.8 bushels per acre, was above the average, but the product was somewhat impaired by wet weather while standing in shocks. The total appears to be 146,439,240 bushels, which amount has been exceeded but once in the records of the state, and that was in 1895. The farm value of the crop Dec. 1 was 25 cents per bushel—total $36,609,810.

RYE.—Total yield 1,283,500 bushels—an average of 18 bushels per acre. Value, $667,420, at 52 cents per bushel.

BARLEY.—Average per acre, 27.5 bushels; total yield 15,566,770 bushels. Value 33 cents per bushel; total value $5,137,034.

Flax Seed.—Amount produced, 173,710 bushels. Value $156,393, at 90 cents per bushel.

Potatoes.—Bushels produced, 9,352,190—average per acre 84 bushels; value 50 cents per bushel; total $4,676,045.

Hay—tame.—Area harvested 3,598,500 acres, total output 6,477,300 tons, or 1.8 tons per acre. Value of crop $35,625,150, at $5.50 per ton.

Hay—wild.—Amount harvested 1,313,310 tons; an average 1.2 tons per acre. Value of crop $5,909,895 at $4.50 per ton.

Pasturage and Grazing.—This item includes pastures, grazing in meadows, and grain fields after harvest and in corn fields in fall and winter months, and can be estimated only by reconing its value as a factor in the production of farm animals and animal products of all kinds. In my judgment the farms of this state should be credited with the full value of the soil output which is the real basis of our great animal industry, and I have tentatively placed the estimate at about $400 per farm, believing that is below rather than above the average. The total output is placed at $80,000,000.

TABULATED CROP SUMMARY.

Crops.	Total Products.	Farm Value Dec. 1.
Corn	345,871,840 bus.	$121.055,144
Wheat	6,408,780 bus.	4,614,321
Oats	146,439,240 bus.	36,609,810
Barley	15.566,770 bus.	5,137,034
Rye	1,283,500 bus.	667,420
Potatoes	9,352,190 bus.	4,677,045
Flax seed	173,770 bus.	35,625,150
Hay (tame)	6,477,300 tons	156,393
Hay (wild)	1,313,310 tons	5,909,895
Pasturage and Grazing (cornfields, etc.)	Estimated	80,000,000
Buckwheat		85.000
Sweet potatoes		135,000
Sorghum and broom corn		190,000
Timothy seed		1.200,000
Clover seed		195,000
Millet and alfalfa		520.000
Sweet corn		510,000
Fruit crops and gardens		5,000,000
Total soil products		$302,286,212

In the above estimate of the value of cereal products no account was made of the increment derived from the consumption of these staple crops on the farms.

FINAL CROP REPORT, 1905.

AVERAGE PER ACRE AND TOTAL YIELD—BY COUNTIES.

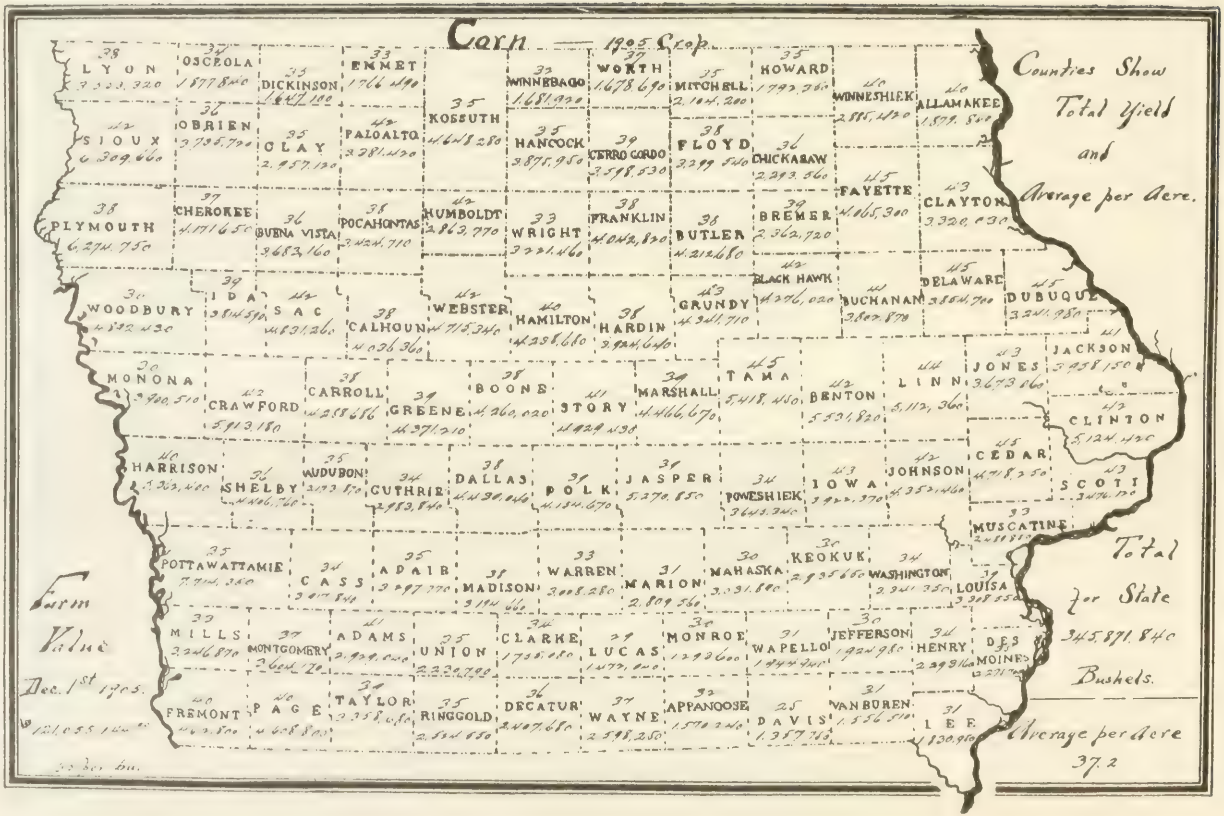
COUNTIES.	Winter Wheat.		Spring Wheat.		Corn.		Oats.		Rye.		Barley.		Flax Seed.		Potatoes.		Hay (Tame.)		Hay (Wild.)	
	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Tons peracre.	Total tons.	Tons per acre.	Total tons.
Adair	15	2,600	14	43,540	35	3,297,770	30	896,460	24	1,680	25	72,700	....	....	67	77,720	1.8	82,030	1.0	5,250
Adams	15	10,200	13	6,110	41	2,929,040	33	545,320	22	3,080	30	67,200	....	....	60	41,400	1.8	59,040	1 0	2,140
Allamakee	18	3,960	15	27,150	40	1,879,840	35	1,439,970	18	28,020	30	329,700	10	1,450	90	85,050	2 2	98,890	1.5	2,530
Appanoose	20	12,400	16	1,760	32	1,570,240	32	381,120	18	7,380	30	2,550	....	....	60	64,800	1 5	89,800	1.2	1,210
Audubon		. .	14	122,920	35	3,173,870	28	855,960	18	2,250	25	181,250	....	......	85	83,300	1.8	54,610	1.0	6,180
Benton	20	800	18	9,180	42	5,531,820	33	2,027,190	17	7,780	28	381,640	....	....	85	145,350	1 6	66,100	1 2	10,870
Black Hawk		....	15	4,950	42	4,276,020	34	1,715,980	16	20,360	33	100,280	....	....	90	109,800	1.8	65.660	1.5	18,760
Boone	...	....	15	26,250	38	4,260,020	30	1,536,580	15	3,390	25	7,010	....	......	74	76,180	1 9	41,780	1.5	36,220
Bremer	...	... ...	17	5,270	39	2,362,720	40	2,108,840	25	41,500	24	61,960	8	1,120	65	78,650	2 0	43,980	1 5	28,680
Buchanan	18	750	16	1,630	41	3,802,870	40	2,043,440	18	14,040	31	51,530	10	150	92	90,160	1 8	80,910	1.5	20,800
Buena Vista	.	....	14	17,920	36	3,683,160	38	2,567,860	20	1,120	28	84,700	9	1,440	75	90,750	1 6	38,620	1 2	26,520
Butler	...	....	14	4,900	38	4,212,680	30	2,287,500	15	14,550	25	29,750	11	560	65	78,130	1 7	41,320	1 2	14,530
Calhoun	..	....	14	88,150	38	4,036,360	37	2,339,880	22	3,080	32	117,120	12	1,680	82	77,080	1 6	36,020	1.0	22,010
Carroll		....	15	97,870	38	4,288,686	35	2,107,350	20	1,740	30	181,560		..... .	90	145,800	1 8	53,410	1 5	21,060
Cass	20	16,240	12	78,240	34	3,917,840	27	883,980	20	3,280	30	107,100	....	....	90	138,150	2 0	68,580	1.2	2,900
Cedar	22	14,080	18	10,980	45	4,718,250	40	1,280,220	14	8,540	24	442,820	..	..... .	76	71,220	1 8	91,380	1 0	550
Cerro Gordo	...	. ...	13	6,370	39	3,598,530	33	3,160,740	16	2,880	26	48,880	9	2,970	91	96,460	1 0	61;570	1.2	17,180
Cherokee	..	....	15	68,460	37	4 171,650	42	2,362,500	18	720	27	173,070	9	1,170	95	108,300	2.0	63,040	1 3	15,750
Chickasaw	...	. ...	15	9,300	36	2,293.560	33	2,152,590	15	7,720	29	122,670	10	12,300	75	77,250	2 0	55,080	1 4	16,980
Clarke	20	2,400	16	160	34	1,755,080	28	425.710	20	2,400	20	4,400	...	......	98	89.670	1 5	74,280	1 0	310
Clay	...	....	13	17,160	35	2,957,120	36	2,168,280	22	2,170	22	217,180	9	1,450	110	99,550	1 7	45,810	1 2	28,340
Clayton	22	23,320	16	33,760	43	3,320,030	40	2,460,480	18	73,980	32	392,320	..	......	90	136,890	2 0	108,160	1 5	3,160
Clinton	18	7,380	14	12,880	42	5,124,420	33	1,323,960	18	25,380	27	248,670	....	....	105	112,350	1.5	96,990	1 0	3,010
Crawford	...	....	13	279,110	42	5,913,180	37	1,854,810	20	4,190	30	186,900	...	. .	110	187,100	2 0	86,440	1 5	10,360
Dallas	20	16,200	13	15,080	38	4,430,040	33	1,330,130	12	6,020	25	12,420	..	....	80	77,600	2.0	63,340	1.5	8,790
Davis	14	9,100	..	....	25	1,357,750	28	454,160	14	21,840	....	....	....	......	68	43,520	1 5	86,280	1 0	110
Decatur	19	7,790		....	36	2,407,680	29	384,830	21	5,390	.	....		....	65	43,550	1 5	73,550	1.0	420
Delaware	22	15,840	....	.....	45	3,854,700	40	1,570,240	20	33,060	25	191,250	...	....	85	98,600	2.0	94,560	1 5	12,100
Des Moines	20	36,500	14	3,780	35	2,275,700	34	935,480	20	36,380	28	17,640	...	....	80	73,040	1 8	50,720	1.2	330
Dickinson		... ..	12	25,560	35	1,647,100	35	1,309,350	15	900	30	412,500	9	3,780	60	32,400	2 0	26,760	1.5	26,500
Dubuque	13	1,350	14	17,220	45	3,241,980	40	1,997,200	22	21,780	30	165,600	....	....	65	104,650	1.6	92,640	1.0	2,140

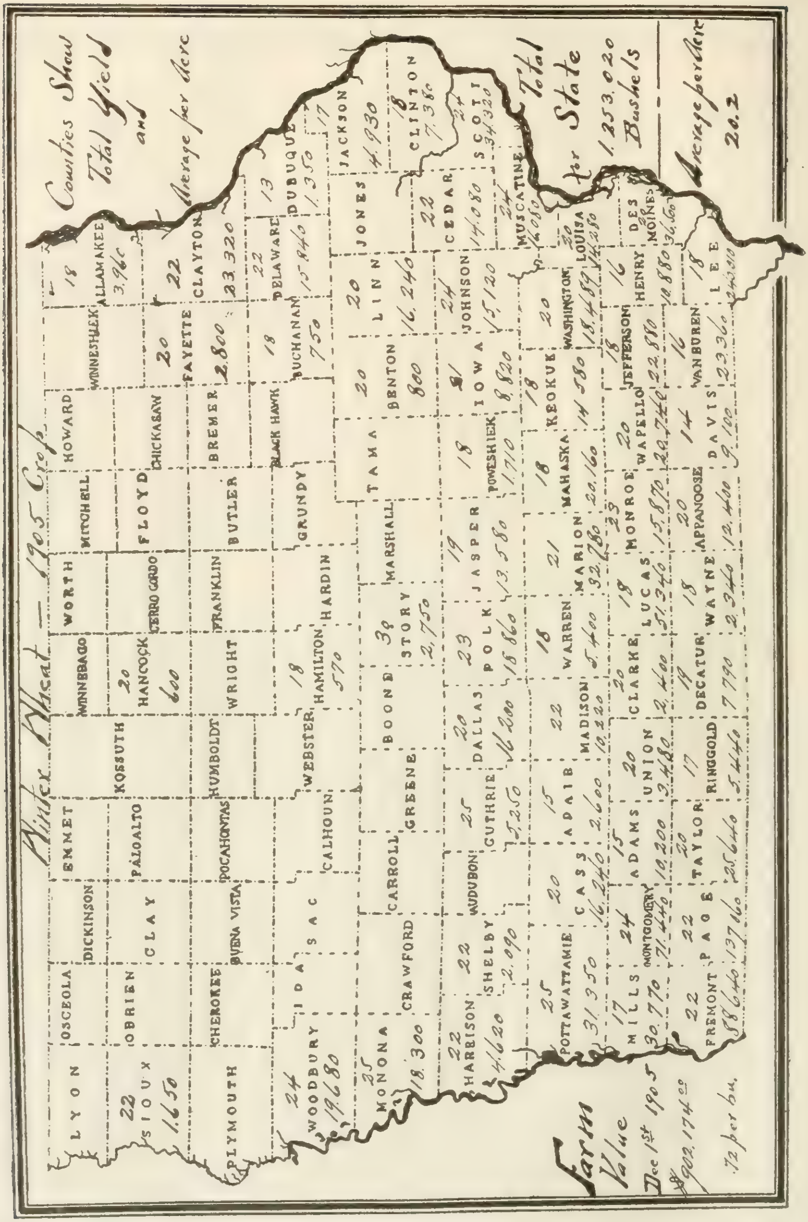
Emmet	...	......	14	11,340	33	1,766,490	32	1,127,840	20	1,280	28	52,080	10	2,900	70	36,750	1.8	131,730	1.4	23,730
Fayette	20	2,800	15	17,550	45	4,065,300	41	2,692,170	22	14,960	32	261,210	9	2,690	70	102,970	1.8	04,220	1.4	17,000
Floyd	.	......	15	2,760	38	3,299,540	35	2,599,410	18	20,130	30	139,080	10	7,250	65	118,300	2.0	61,820	1.5	7,720
Franklin	..	......	15	18,600	38	4,012,820	40	3,009,640	16	1,760	35	39,300	12	1,920	92	97,520	1.5	14,320	1.2	23,170
Fremont	22	88,640	15	18,210	40	4,612,800	32	358,170	20	6.730		...	..	..	80	62,720	1.5	27,050	1.5	1,820
Greene	...	....	14	8,680	39	4,371,210	34	1,673,140	15	630	27	54,050	10	1,200	90	62,100	1.3	38,330	1.0	20,140
Grundy	...	....	14	12,040	43	4,341,710	31	2,059,930	18	24,840	30	225,300	....	....	110	115,200	1.8	65 260	1.5	14,640
Guthrie	25	5,250	12	56,040	34	2,983,840	28	1,148,140	12	1,220	25	52,250	.	..	88	59,850	1,7	61,650	1.0	6,570
Hamilton	18	570	14	34,580	40	4,238,680	31	1,744,370	20	560	30	22,950	12	1,560	98	119,540	1.8	54,650	1.2	28,980
Hancock	20	60	15	30,450	35	2,875,950	33	2,579,280	21	1,170	29	61,670	10	3,100	110	111,500	2.2	30,060	1.5	29,910
Hardin	..	.....	12	27,720	38	3,924,640	36	2,231,160	14	1,640	28	30,240	8	160	80	103,280	2.0	55,820	1.5	22,860
Harrison	22	4,620	12	260,040	40	5,362,400	35	658,780	16	3,280	28	35,650	.	....	75	95,250	2.0	38,350	1.3	21,290
Henry	16	10,880	14	1,680	34	2,293,160	32	963,360	17	38,420	24	15,360	.	..	90	50,850	1.7	52,480	1.0	00
Howard	....	......	14	11,270	35	1,792,350	33	1,913,140	15	570	38	299,480	11	31,920	65	61,750	1.7	56,390	1.2	12,216
Humboldt	...	....	18	58,800	42	2,863,770	36	1,767,520	20	160	30	37,990	10	1,440	115	55,200	1.8	42,240	1.5	26,946
Ida		......	13	76,960	39	3,814,590	36	1,335,960	20	210	30	225,630	..		102	96,900	1.9	45,090	1.2	4,970
Iowa	21	8,820	16	13,360	43	3,922,370	33	1,257,960	17	10,130	28	114,840	..	.....	97	119,310	2.0	87,840	1.5	2,400
Jackson	17	4,930	15	21,360	41	3,958,150	37	1,058,570	18	25,360	30	183,210	.	.....	70	81,900	1.8	106,060	1.5	60
Jasper	19	13,580	13	42,250	39	5,270,850	33	1,551,160	20	4,220	25	60,259	.	....	75	121,600	1.8	96,350	1.5	3,100
Jefferson	18	22,880	12	1,810	30	1,924,980	32	769,530	14	50,820	30	45,600	....	.	87	58,290	1.8	59,510	1.0	60
Johnson	24	15,120	16	3,360	42	4,352,460	36	1,452,960	15	24,240	26	185,610			105	132,200	2.0	102,730	1.0	2,540
Jones	..		15	9,930	43	3,673,060	31	852,280	20	17,440	27	201,120			102	98,940	2.0	102,960	1.0	560
Keokuk	18	14,580	16	6,800	30	2,935,650	32	1,011,520	20	56,800	25	139,500	.		85	73,100	1.5	68,940	1.0	520
Kossuth	..	. .	15	63,540	35	4,648,280	34	4,157 520	22	2,200	28	84,750	9	8,190	94	149,160	1.6	60,190	1.2	92,430
Lee	18	240,010		...	31	1,830,950	28	600,320	18	74,880	30	3,600		......	50	70,800	1.8	83,080	1.0	100
Linn	20	16,240	16	40,480	44	5,112,360	41	2,055,330	20	18,640	30	27,690	..	.....	75	135,750	1.6	96,160	1.5	9,010
Louisa	20	14,280	15	9,150	39	3,308,550	35	812,350	18	52,020	28	19,880	..	.....	70	40,250	1.8	35,140	1.5	2,890
Lucas	18	51,340		...	29	1,472,040	30	383,800	16	6,410		......			50	28,750	1.6	107,260	1.5	460
Lyon			15	246,150	38	3,553,320	40	2,326,880	18	2,700	2	1,435,560	10	1,040	85	105,400	2.0	35,700	1.5	17,230
Madison	22	10,220	16	16,320	38	33,194,660	32	899,840	17	3,450		81,090		....	112	76,280	2.0	87,820	1.2	2,010
Mahaska	18	20,160	13	10,530	30	,031,890	28	853,690	15	15,390		138,320	..	.	83	75,530	1.8	70,940	1.5	1,960
Marion	21	32,780	15	13,130	31	2,809,560	28	761,880	20	7,080	25	86,750	.	.	70	59,640	1.8	66,730	1.2	1,290
Marshall	..	..	14	48,870	39	4,466,670	40	2,324,840	20	5,600	31	68,510		......	80	91,200	2.0	70,360	1.0	2,610
Mills	17	30,770	12	65,280	33	3,246,870	32	456,020	20	840	28	16,880			90	77,400	2.0	44,950	1.5	7,550
Mitchell	..	....	12	6,020	35	2,101,200	36	2,554,920	18	3,600	25	243,950	10	4,100	60	97,200	1.8	54,060	1.2	3,680
Monona	25	18,300	14	244,060	30	3,900,510	33	642,840	20	5,140	31	199,020	10	210	93	113,460	2.0	19 850	1.6	33.870
Monroe	23	15,870	20	4,200	30	1,293,600	30	556,200	20	17,400	24	7,140	..	.	50	30,500	1.8	72,840	1.0	350
Montgomery	24	71,440	13	115,960	37	3,604,170	35	481,400	20	1,780	28	57,680		....	97	78,870	2.2	80,800	1.0	1,280
Muscatine	24	16,080	16	6,510	33	2,489,850	35	602,350	19	60,610	25	219,250	...	......	72	152,640	2.0	51,680	1.5	2,510
O'Brien	....	....	15	94,950	36	3,735,720	30	1,828.980	20	1,120	25	510,150	10	3,220	90	101,160	2.0	53,700	1.5	17,760
Osceola		.	12	42,120	34	1,877,840	35	1,678,600	15	1,450	24	537,120	11	660	80	56,150	2.0	34,270	1.5	15,220
Page	22	137,060	14	29,540	40	4,608,800	32	567,680	21	7,350	25	20,050	...	.....	85	77,350	1.5	47,430	1.0	350
Palo Alto	...	....	15	14,550	42	3,381,420	35	426,330	15	580	30	72,300	12	6,880	100	89,000	1.5	22,300	1.5	66,780
Plymouth	.	....	14	724,510	38	6,274,750	35	2,240,550	18	3,320	30	569,250	10	1,660	90	146,700	1.5	37,790	1.0	34,820
Pocahontas		.....	18	19,140	38	3,424,710	40	2,528,480	16	1,280	30	55,750	[illegible]	3,440	94	101,520	2.0	36,240	1.1	48,740
Polk	23	18,860	14	35,840	39	4,154,670	34	1,371,110	16	6,440	26	5,980	....	....	70	134,400	2.0	72,410	1.0	8,610
Pottawattamie	25	31,350	12	226,820	35	7,714,350	36	1,516,320	20	4,460	28	69,440	....	....	92	221.900	1.8	98,480	1.6	19,310
Poweshiek	18	1,710	16	15,750	34	3,645,340	33	1,252,090	16	3,520	28	172,760	...	....	115	125,350	1.8	79,410	1.0	510
Ringgold	17	5,440	10	920	35	2,526,550	32	683,770	15	2,400	20	460	...	....	94	47,940	1.6	90,270	1.0	490
Sac	....	....	11	33,740	42	4,831,260	40	2,056,200	18	1,260	30	284,320	10	400	110	113,300	1.5	51,910	1.0	14,430

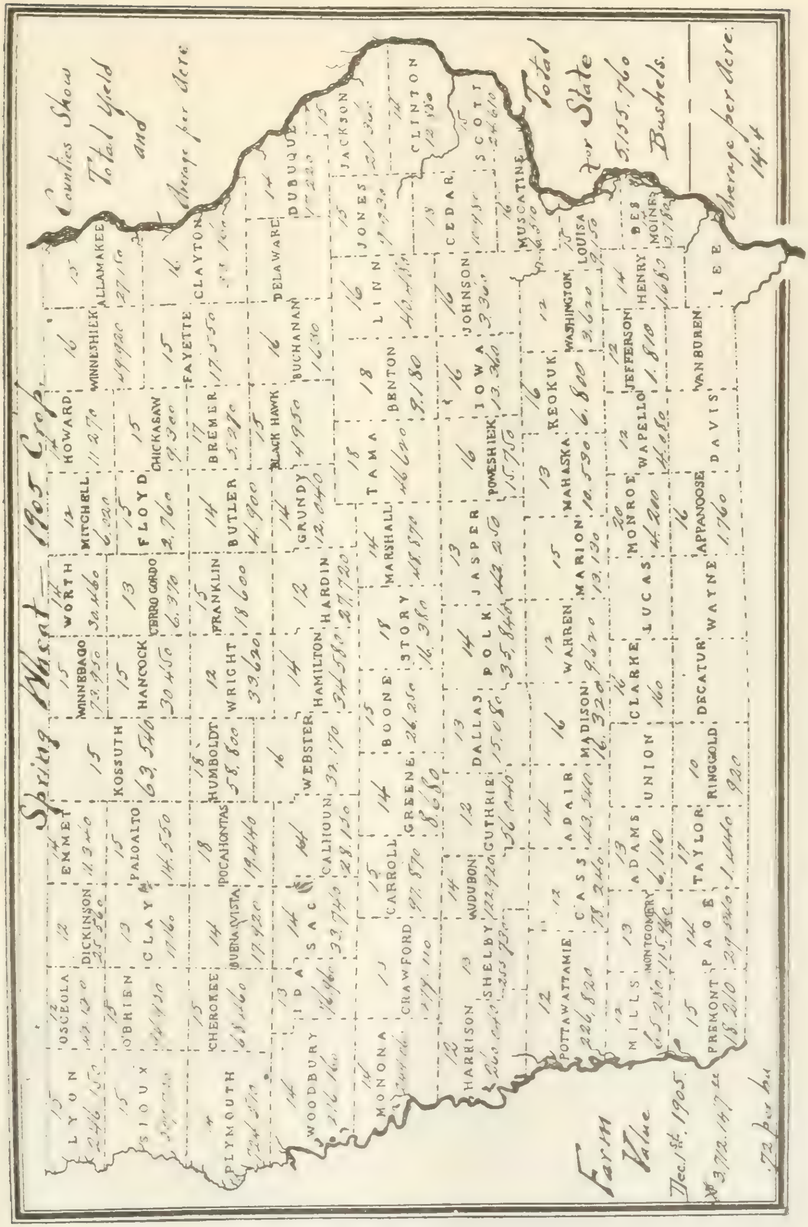
FINAL CROP REPORT, 1905—CONTINUED.

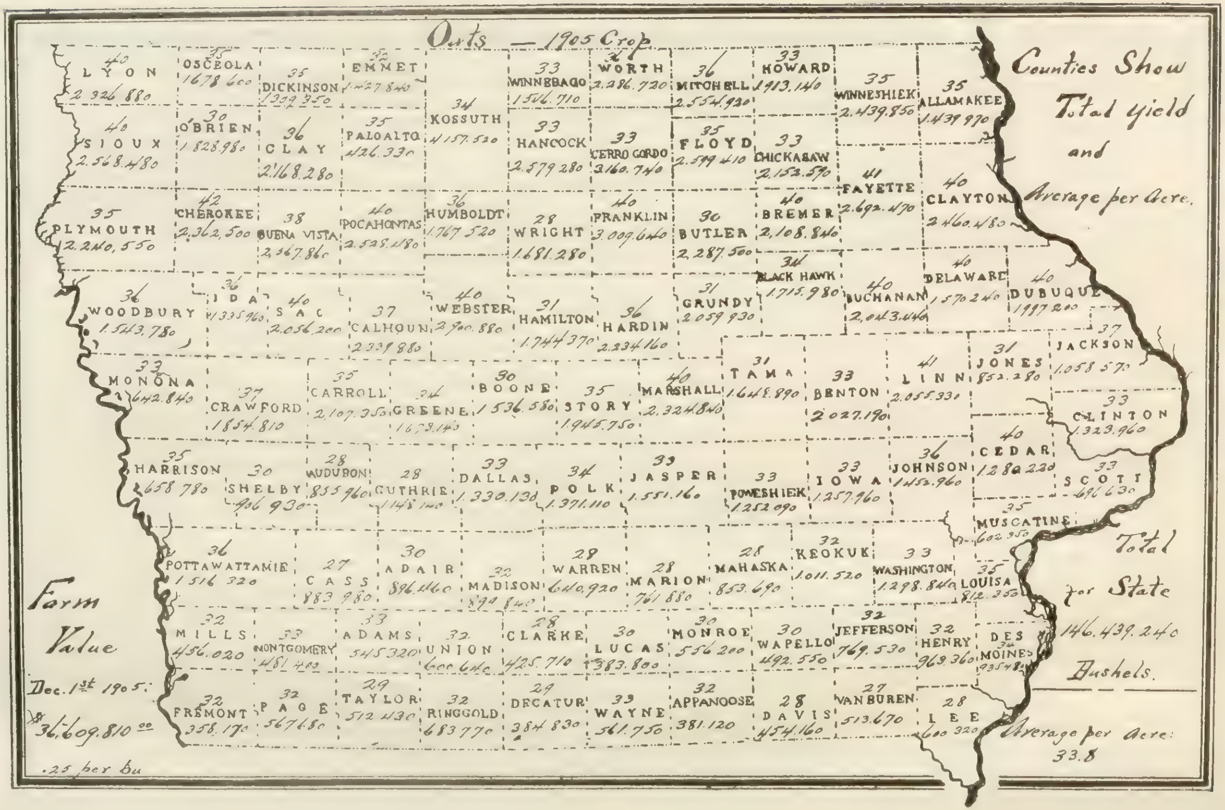
AVERAGE PER ACRE AND TOTAL YIELD—BY COUNTIES.

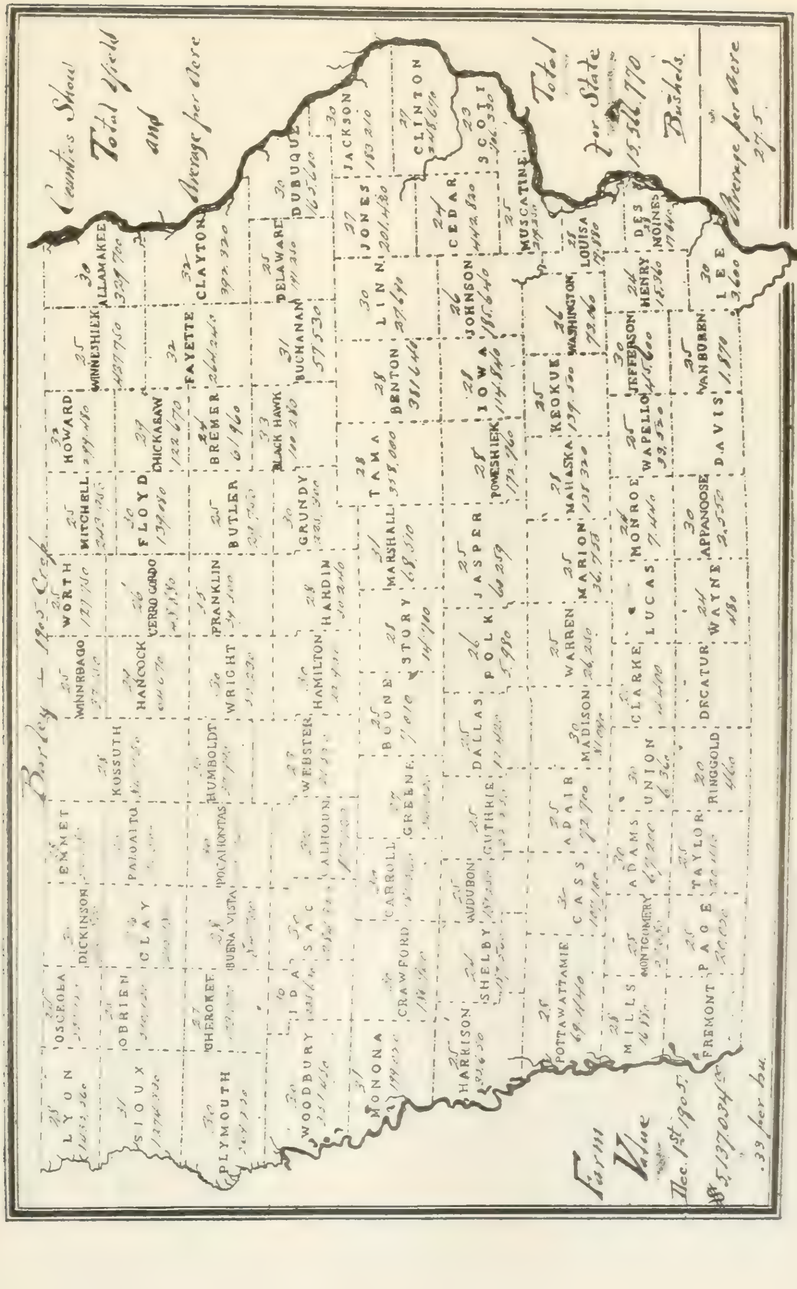
COUNTIES.	Winter Wheat.		Spring Wheat.		Corn.		Oats.		Rye.		Barley.		Flax Seed.		Potatoes.		Hay (Tame.)		Hay. (Wild.)	
	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Bushels per acre.	Total bushels.	Tons per acre.	Total tons.	Tons per acre.	Total tons.
Scott	24	34,320	15	24,610	43	3,476,120	33	696,630	20	23,080	23	706,330		......	105	509,050	1.8	55,330	1 2	5,420
Shelby	22	2,090	13	255,730	36	4,406,760	30	906,980	17	3,230	24	187,560		......	98	125,440	1 8	68,940	1.5	9,780
Sioux	22	1,650	15	507,750	42	6,309,660	40	2,568,480	18	720	31	1,274,330	10	530	112	157,920	2 5	52,820	2 0	42,260
Story	30	2,750	18	16,380	41	4,929,430	35	1,945,750	18	5,220	28	14,700		....	93	78,120	2 2	066,890	1 4	22,120
Tama	...	....	18	46,620	45	5,418,450	31	1,648,890	20	83,500	28	358,000	...	......	80	129,760	2 0	120,820	1.5	7,230
Taylor	20	25,640	17	1,440	39	3,358,680	29	512,430	20	6,820	25	20,450	...	....	90	58,680	1 8	91,990	1.5	1,980
Union	20	3,480	...	....	35	2,230,790	32	600,640	18	1,620	30	6,360	...	....	85	68,950	2 0	93,610	1.0	1,170
Van Buren	16	23,360	....	......	31	1,556,510	27	513,670	12	39,240	25	1,870	..	....	72	34,960	1.5	83,200	1 0	520
Wapello	20	20,740	12	4,080	31	1,944,940	30	492 550	18	36,180	25	33,520		......	70	68,670	1 5	51,390	1 0	160
Warren	18	5,400	12	9,620	33	3,008,280	28	640,920	17	4,930	25	26,250	...	......	74	59,940	1 5	66,460	1 0	1,230
Washington	20	18,489	12	3,620	34	3,341,350	33	1,298,840	18	28,080	26	73,060	...	......	70	48,440	1 8	80,160	1 2	420
Wayne	18	2,340	...	....	37	2,598,250	33	561,750	16	2,240	24	480	....	.	50	25,250	2 0	141,890	1 0	180
Webster	..	....	16	32,170	42	4,715,340	40	2,900,880	15	2,730	23	21,520	11	2,090	65	73,450	2 0	54,410	1 5	52,230
Winnebago	.	....	15	73,950	32	1,681,920	[illegible]	1,546,710	18	810	25	37,150	8	7,720	90	61,380	1 8	31,590	1 3	36,140
Winneshiek	.	....	16	49,920	40	2,885,420	35	2,439,850	20	5,420	25	427,750	12	34,920	78	92,040	1 8	87,970	1 6	9,470
Woodbury	24	19,680	14	216,160	30	4,892,430	36	1,543,780	17	11,470	30	351,450	10	270	88	124,960	1 8	38,800	1.4	23,220
Worth	...	....	14	30,460	37	1,678,690	36	2,286,720	22	880	25	127,750	6	12,540	90	66,880	2 0	49 660	1 4	23,710
Wright		....	12	33,620	33	3,221,460	28	1,681,280	20	3,040	30	55,230	8	2,720	85	71,820	2 0	51,410	1.5	27,930
Totals for State	...	1,253,020	...	5,155,760	...	315,871,840	...	146,439,240	...	1,283,500	..	15,566,770	...	173,770		9,352,190	...	6,477,300	..	1,313,310
Av. per acre	20.2	.....	14.4	....	37.2	....	33.8	....	18	.	27 5	....	9 8	......	84	.....	1 8	....	1.2	.

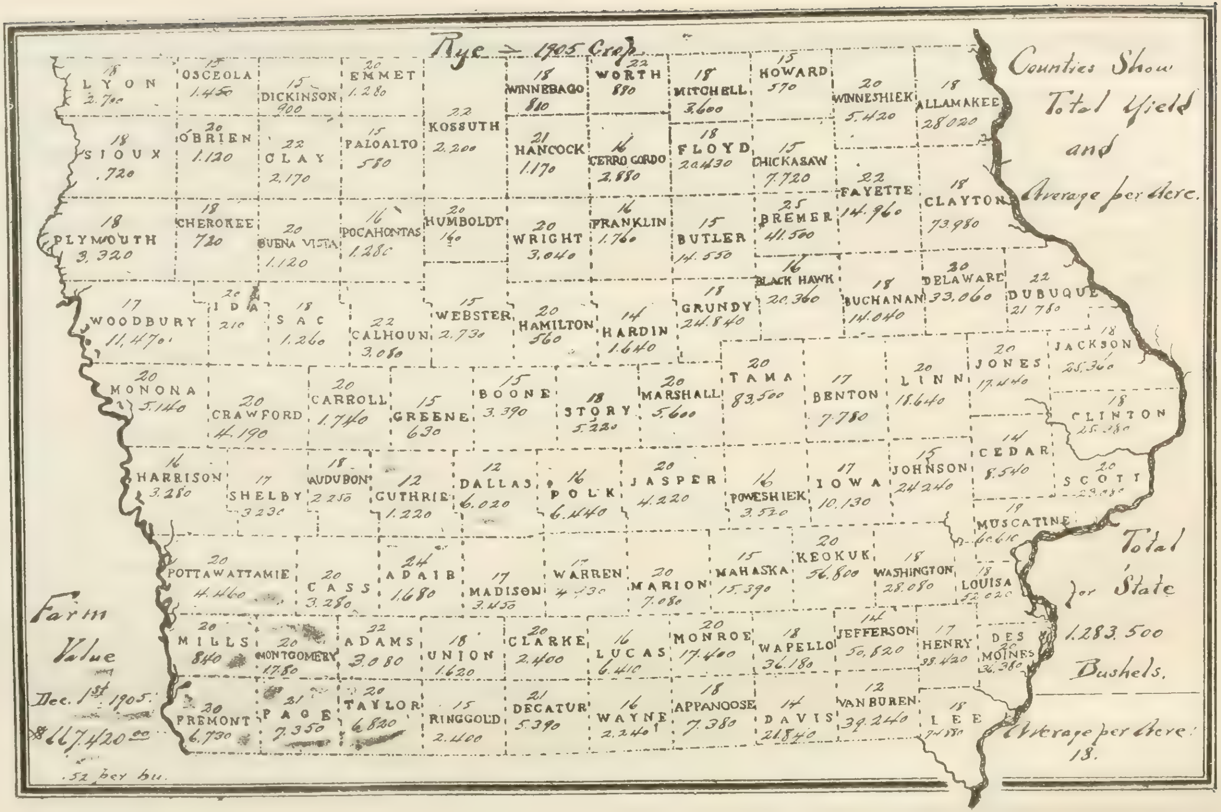

Corn — 1905 Crop.
Counties Show Total Yield and Average per Acre.
38 LYON 3,333,320
34 OSCEOLA 1,577,840
33 DICKINSON 1,647,100
33 EMMET 1,766,490
35 KOSSUTH 4,648,280
32 WINNEBAGO 1,681,920
37 WORTH 1,678,690
35 MITCHELL 2,104,200
35 HOWARD 1,792,360
40 WINNESHIEK 2,885,420
40 ALLAMAKEE 1,579,840
42 SIOUX 6,309,660
36 OBRIEN 3,795,720
35 CLAY 2,957,120
42 PALOALTO 3,281,420
35 HANCOCK 3,875,950
39 CERRO GORDO 3,598,530
38 FLOYD 3,299,540
36 CHICKASAW 2,293,560
45 FAYETTE 4,065,300
43 CLAYTON 3,320,030
38 PLYMOUTH 6,274,750
37 CHEROKEE 4,171,650
36 BUENA VISTA 3,683,160
38 POCAHONTAS 3,424,710
42 HUMBOLDT 2,863,770
33 WRIGHT 3,221,460
38 FRANKLIN 4,042,820
38 BUTLER 4,212,680
39 BREMER 2,362,720
42 BLACK HAWK 4,276,020
44 BUCHANAN 3,807,870
45 DELAWARE 3,864,700
45 DUBUQUE 3,241,980
30 WOODBURY 4,832,430
39 IDA 3,814,590
42 SAC 4,631,260
38 CALHOUN 4,036,360
42 WEBSTER 4,715,340
40 HAMILTON 4,238,680
38 HARDIN 3,924,640
43 GRUNDY 4,341,710
30 MONONA 3,400,510
42 CRAWFORD 5,913,180
38 CARROLL 4,258,686
39 GREENE 4,371,210
38 BOONE 4,260,020
41 STORY 4,929,430
39 MARSHALL 4,466,670
45 TAMA 5,418,450
42 BENTON 5,531,820
44 LINN 5,112,360
43 JONES 3,673,060
41 JACKSON 3,958,150
42 CLINTON 5,124,420
40 HARRISON 5,362,400
36 SHELBY 4,406,760
35 AUDUBON 3,173,870
34 GUTHRIE 2,983,840
38 DALLAS 4,430,040
39 POLK 4,154,670
39 JASPER 5,270,850
34 POWESHIEK 3,643,340
43 IOWA 3,922,370
42 JOHNSON 4,352,460
45 CEDAR 4,718,250
43 SCOTT 3,476,120
33 MUSCATINE 2,481,810
35 POTTAWATTAMIE 7,714,360
34 CASS 3,017,840
35 ADAIR 3,297,770
38 MADISON 3,194,660
33 WARREN 3,008,280
31 MARION 2,809,560
30 MAHASKA 3,031,840
30 KEOKUK 2,935,650
34 WASHINGTON 3,341,350
39 LOUISA 3,308,550
33 MILLS 3,246,870
37 MONTGOMERY 3,604,170
41 ADAMS 2,929,040
35 UNION 2,230,790
34 CLARKE 1,750,080
29 LUCAS 1,477,040
30 MONROE 1,293,600
31 WAPELLO 1,944,940
30 JEFFERSON 1,924,980
34 HENRY 2,293,160
35 DES MOINES 2,217,
40 FREMONT 4,62,800
40 PAGE 4,608,800
34 TAYLOR 3,358,680
35 RINGGOLD 2,524,650
36 DECATUR 2,407,680
37 WAYNE 2,598,250
32 APPANOOSE 1,570,240
25 DAVIS 1,357,760
31 VAN BUREN 1,556,510
31 LEE 1,830,960
Total for State 345,871,840 Bushels.
Average per Acre 37.2
Farm Value Dec. 1st 1905.
$121,055,144
35 per bu.


Winter Wheat — 1905 Crop
Counties Show Total Yield and Average per Acre
Total for State 1,253,020 Bushels
Average per Acre 20.2
Farm Value Dec 1st 1905 $902,174.00 .72 per bu.
LYON
SIOUX 22 1,650
PLYMOUTH
WOODBURY 24 19,680
MONONA 25 18,300
HARRISON 22 4,620
POTTAWATTAMIE 25 31,350
MILLS 17 30,770
FREMONT 22 58,640
OSCEOLA
OBRIEN
CHEROKEE
IDA
CRAWFORD
SHELBY 22 2,090
CASS 20 16,240
MONTGOMERY 24 71,440
PAGE 22 137,160
DICKINSON
CLAY
BUENA VISTA
SAC
CARROLL
AUDUBON
GUTHRIE 25 5,250
ADAMS 15 10,200
TAYLOR 20 25,640
EMMET
PALOALTO
POCAHONTAS
CALHOUN
GREENE
ADAIR 15 2,600
UNION 20 3,480
RINGGOLD 17 5,440
KOSSUTH
HUMBOLDT
WEBSTER
DALLAS 20 16,200
MADISON 22 10,220
CLARKE 20 2,400
DECATUR 19 7,770
WINNEBAGO
HANCOCK 20 600
WRIGHT
HAMILTON 18 570
BOONE
POLK 23 18,860
WARREN 18 5,400
LUCAS 18 51,340
WAYNE 18 2,340
WORTH
CERRO GORDO
FRANKLIN
HARDIN
STORY 30 2,750
JASPER 19 13,580
MARION 21 32,780
MONROE 23 15,870
APPANOOSE 20 12,400
MITCHELL
FLOYD
BUTLER
GRUNDY
MARSHALL
TAMA
POWESHIEK 18 1,710
MAHASKA 18 20,160
WAPELLO 20 20,740
DAVIS 14 9,100
HOWARD
CHICKASAW
BREMER
BLACK HAWK
BENTON 20 800
IOWA 21 8,820
KEOKUK 18 14,580
JEFFERSON 18 22,880
VAN BUREN 16 23,360
WINNESHIEK
FAYETTE 20 2,800
BUCHANAN 18 750
LINN 20 16,240
JOHNSON 24 15,120
WASHINGTON 20 18,489
HENRY 16 10,880
LEE 18 24,310
ALLAMAKEE 18 3,960
CLAYTON 22 23,320
DELAWARE 22 15,840
JONES
CEDAR 22 14,080
MUSCATINE 24 4,080
LOUISA 20 14,280
DES MOINES 20 36,160
DUBUQUE 13 1,350
JACKSON 17 4,930
CLINTON 18 7,380
SCOTT 24 34,320


Spring Wheat 1905 Crop
Counties Show Total Yield and Average per Acre
Total for State 5155.760 Bushels
Average per Acre 14.4
Farm Value Dec. 1st. 1905. $3712.147.20 .72 per bu
LYON
OSCEOLA
DICKINSON
EMMET
KOSSUTH
WINNEBAGO
WORTH
MITCHELL
HOWARD
WINNESHIEK
ALLAMAKEE
SIOUX
O'BRIEN
CLAY
PALOALTO
HANCOCK
CERRO GORDO
FLOYD
CHICKASAW
FAYETTE
CLAYTON
PLYMOUTH
CHEROKEE
BUENA VISTA
POCAHONTAS
HUMBOLDT
WRIGHT
FRANKLIN
BUTLER
BREMER
BLACK HAWK
BUCHANAN
DELAWARE
DUBUQUE
WOODBURY
IDA
SAC
CALHOUN
WEBSTER
HAMILTON
HARDIN
GRUNDY
TAMA
BENTON
LINN
JONES
JACKSON
CLINTON
MONONA
CRAWFORD
CARROLL
GREENE
BOONE
STORY
MARSHALL
POWESHIEK
IOWA
JOHNSON
CEDAR
SCOTT
MUSCATINE
HARRISON
SHELBY
AUDUBON
GUTHRIE
DALLAS
POLK
JASPER
POTTAWATTAMIE
CASS
ADAIR
MADISON
WARREN
MARION
MAHASKA
KEOKUK
WASHINGTON
LOUISA
MILLS
MONTGOMERY
ADAMS
UNION
CLARKE
LUCAS
MONROE
WAPELLO
JEFFERSON
HENRY
DES MOINES
FREMONT
PAGE
TAYLOR
RINGGOLD
DECATUR
WAYNE
APPANOOSE
DAVIS
VAN BUREN
LEE


Oats — 1905 Crop
Counties Show Total yield and Average per Acre.
40 LYON 2.326.880
35 OSCEOLA 1678.600
35 DICKINSON 1.339.350
32 EMMET 1.427.840
34 KOSSUTH 4.157.520
33 WINNEBAGO 1.546.710
31 WORTH 2.286.720
36 MITCHELL 2.554.920
33 HOWARD 1.913.140
35 WINNESHIEK 2.439.850
35 ALLAMAKEE 1.439.970
40 SIOUX 2.568.480
30 O'BRIEN 1.828.980
36 CLAY 2.168.280
35 PALOALTO 426.330
33 HANCOCK 2.579.280
33 CERRO GORDO 3.160.740
35 FLOYD 2.599.410
33 CHICKASAW 2.152.590
41 FAYETTE 2.692.470
40 CLAYTON 2.460.480
35 PLYMOUTH 2.240.550
42 CHEROKEE 2.362.500
38 BUENA VISTA 2.367.860
40 POCAHONTAS 2.528.480
36 HUMBOLDT 1.767.520
28 WRIGHT 1.681.280
40 FRANKLIN 3.009.640
30 BUTLER 2.287.500
40 BREMER 2.108.840
34 BLACK HAWK 1.715.980
40 BUCHANAN 2.043.440
40 DELAWARE 1.570.240
40 DUBUQUE 1.997.200
36 WOODBURY 1.543.780
36 IDA 1.335.960
40 SAC 2.056.200
37 CALHOUN 2.339.880
40 WEBSTER 2.900.880
31 HAMILTON 1.744.370
36 HARDIN 2.234.160
31 GRUNDY 2.059.930
37 JACKSON 1.058.570
33 MONONA 642.840
37 CRAWFORD 1854.810
35 CARROLL 2.107.350
34 GREENE 1.673.140
30 BOONE 1.536.580
35 STORY 1.945.750
40 MARSHALL 2.324.840
31 TAMA 1.648.890
33 BENTON 2.027.190
41 LINN 2.055.330
31 JONES 852.280
33 CLINTON 1.323.960
35 HARRISON 658.780
30 SHELBY 906.930
28 AUDUBON 855.960
28 GUTHRIE 1.148.140
33 DALLAS 1.330.138
34 POLK 1.371.110
33 JASPER 1.551.160
33 POWESHIEK 1.252.090
33 IOWA 1.257.960
36 JOHNSON 1.452.960
40 CEDAR 1.280.220
33 SCOTT 696.630
35 MUSCATINE 602.950
36 POTTAWATTAMIE 1.516.320
27 CASS 883.980
30 ADAIR 896.460
32 MADISON 890.840
28 WARREN 640.920
28 MARION 761.880
28 MAHASKA 853.690
32 KEOKUK 1.011.520
33 WASHINGTON 1.298.840
35 LOUISA 812.350
32 MILLS 456.020
33 MONTGOMERY 481.400
33 ADAMS 545.320
32 UNION 600.640
28 CLARKE 425.710
30 LUCAS 383.800
30 MONROE 556.200
30 WAPELLO 492.550
32 JEFFERSON 769.530
32 HENRY 963.360
34 DES MOINES 935.480
32 FREMONT 358.170
32 PAGE 567.680
29 TAYLOR 512.430
32 RINGGOLD 683.770
29 DECATUR 384.830
33 WAYNE 561.750
32 APPANOOSE 381.120
28 DAVIS 454.160
27 VAN BUREN 513.670
28 LEE 600.320
Total for State 146.439.240 Bushels.
Average per Acre: 33.8
Farm Value Dec. 1st 1905: $36.609.810.00
.25 per bu


Barley — 1905 Crop
Counties Show Total Yield and Average per Acre
Total for State 15,516,770 Bushels
Average per Acre 27.5
Farm Value Dec. 1st 1905. $5,137,034.00
.33 per bu.
LYON
OSCEOLA
DICKINSON
EMMET
KOSSUTH
WINNEBAGO
WORTH 25 127,750
MITCHELL 25
HOWARD 32 299,480
WINNESHIEK 25 437,750
ALLAMAKEE 30 329,700
SIOUX 31
OBRIEN
CLAY
PALO ALTO
HANCOCK 24
CERRO GORDO 26
FLOYD 30 139,080
CHICKASAW 29 122,670
FAYETTE 32
CLAYTON 32 392,320
PLYMOUTH 30
CHEROKEE 27
BUENA VISTA 28
POCAHONTAS
HUMBOLDT
WRIGHT 30
FRANKLIN 25
BUTLER 25
BREMER 24 61,960
BLACK HAWK 23 10,280
BUCHANAN 31 57,530
DELAWARE 25 141,250
DUBUQUE 30 165,610
WOODBURY 30
IDA 30
SAC
CALHOUN
WEBSTER 27
HAMILTON 30
HARDIN 28 10,240
GRUNDY 30
TAMA 28 358,000
BENTON 28 351,640
LINN 30 37,690
JONES 27 201,480
JACKSON 30 183,210
CLINTON 27 248,610
MONONA 27
CRAWFORD
CARROLL
GREENE 27
BOONE 25 7,010
STORY 25 14,700
MARSHALL 31 68,510
POWESHIEK 28 172,760
IOWA 28 114,840
JOHNSON 26 186,640
CEDAR 24 442,820
SCOTT 23 106,330
MUSCATINE 25
HARRISON 25
SHELBY 22
AUDUBON 25
GUTHRIE 25
DALLAS 25 17,420
POLK 26 5,980
JASPER 25 6,259
MAHASKA 25 135,320
KEOKUK 25 139,500
WASHINGTON 26 72,460
LOUISA 25
POTTAWATTAMIE 25 69,440
CASS 32 109,100
ADAIR 25 27,700
MADISON 30 81,090
WARREN 25 26,250
MARION 25 32,758
MONROE 24 7,440
WAPELLO 25 93,520
JEFFERSON 30 45,600
HENRY 24 15,960
DES MOINES 23 17,640
MILLS 28 16,330
MONTGOMERY 25
ADAMS 30 67,200
UNION 30 6,360
CLARKE
LUCAS
WAYNE 24 480
APPANOOSE 30 2,550
DAVIS
VAN BUREN 25 1,870
LEE 30 3,600
FREMONT
PAGE 25
TAYLOR 25
RINGGOLD 20
DECATUR


Rye — 1905 Crop.

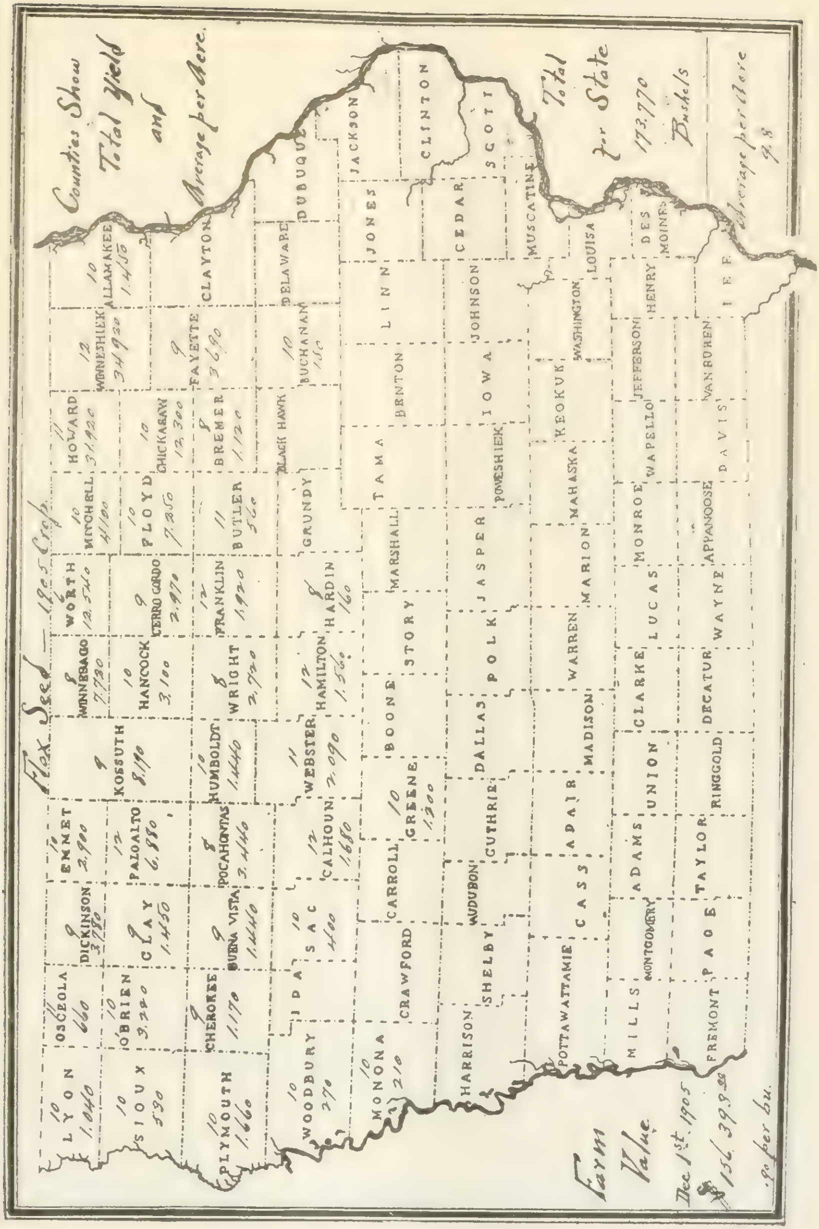
Counties Show Total Yield and Average per Acre.

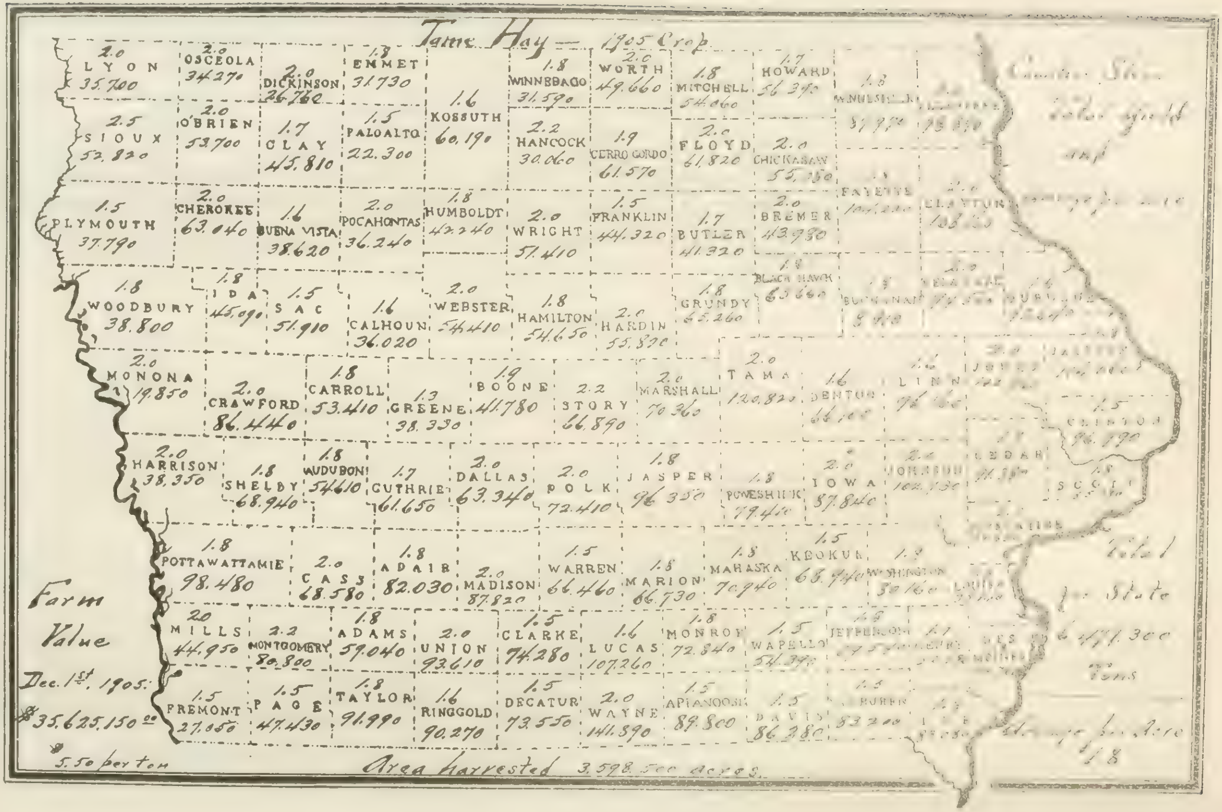
Total for State 1.283.500 Bushels.

Average per Acre: 18.

Farm Value Dec. 1st 1905. $667.420.00 .52 per bu.

18 LYON 2.700
15 OSCEOLA 1.450
15 DICKINSON 900
20 EMMET 1.280
18 WINNEBAGO 810
22 WORTH 880
18 MITCHELL 3.600
15 HOWARD 570
20 WINNESHIEK 5.420
18 ALLAMAKEE 28020
18 SIOUX .720
20 O'BRIEN 1.120
22 CLAY 2.170
15 PALOALTO 580
22 KOSSUTH 2.200
21 HANCOCK 1.170
16 CERRO GORDO 2.880
18 FLOYD 24430
15 CHICKASAW 7.720
22 FAYETTE 14.960
18 CLAYTON 73.980
18 PLYMOUTH 3.320
18 CHEROKEE 720
20 BUENA VISTA 1.120
16 POCAHONTAS 1.280
20 HUMBOLDT 160
20 WRIGHT 3.040
16 FRANKLIN 1.760
15 BUTLER 14.550
25 BREMER 41.500
16 BLACK HAWK 20.360
18 BUCHANAN 14.040
20 DELAWARE 33.060
22 DUBUQUE 21 780
17 WOODBURY 11.470
20 IDA 210
18 SAC 1.260
22 CALHOUN 3.080
15 WEBSTER 2.730
20 HAMILTON 560
14 HARDIN 1.640
18 GRUNDY 24.840
18 JACKSON 25.360
20 JONES 17.440
20 MONONA 5.140
20 CRAWFORD 4.190
20 CARROLL 1.740
15 GREENE 630
15 BOONE 3.390
18 STORY 5.220
20 MARSHALL 5.600
20 TAMA 83.500
17 BENTON 7.780
20 LINN 18.640
18 CLINTON 25.280
16 HARRISON 3.280
17 SHELBY 3.230
18 AUDUBON 2.250
12 GUTHRIE 1.220
12 DALLAS 6.020
16 POLK 6.440
20 JASPER 4.220
16 POWESHIEK 3.520
17 IOWA 10.130
15 JOHNSON 24240
14 CEDAR 8.540
20 SCOTT 23.080
20 POTTAWATTAMIE 4.460
20 CASS 3.280
24 ADAIR 1.680
17 MADISON 3.450
17 WARREN 4.430
20 MARION 7.080
15 MAHASKA 15.390
20 KEOKUK 56.800
18 WASHINGTON 28.080
19 MUSCATINE 66.610
18 LOUISA 52.020
20 MILLS 840
20 MONTGOMERY 1780
22 ADAMS 3.080
18 UNION 1.620
20 CLARKE 2.400
16 LUCAS 6.410
20 MONROE 17.400
18 WAPELLO 36.180
14 JEFFERSON 50.620
17 HENRY 38.420
20 DES MOINES 36.380
20 FREMONT 6.730
21 PAGE 7.350
20 TAYLOR 6.820
15 RINGGOLD 2.400
21 DECATUR 5.390
16 WAYNE 2.240
18 APPANOOSE 7.380
14 DAVIS 21.840
12 VAN BUREN 39.240
18 LEE 74.880


Flax Seed — 1905 Crop.
Counties Show Total Yield and Average per Acre.
Total for State 173,770 Bushels
Average per Acre 9.8
Farm Value Dec 1st 1905 $156,393.00 .90 per bu.
LYON 10 1,040
OSCEOLA 11 660
DICKINSON 9 3780
EMMET 10 2,900
KOSSUTH 9 8,190
WINNEBAGO 8 7,730
WORTH 6 12,540
MITCHELL 10 4,100
HOWARD 11 31,920
WINNESHIEK 12 34,920
ALLAMAKEE 10 1,450
SIOUX 10 530
O'BRIEN 10 3,320
CLAY 9 1,450
PALO ALTO 12 6,880
HANCOCK 10 3,100
CERRO GORDO 9 2,970
FLOYD 10 7,350
CHICKASAW 10 12,300
FAYETTE 9 3,690
CLAYTON
PLYMOUTH 10 1,660
CHEROKEE 9 1,170
BUENA VISTA 9 1,440
POCAHONTAS 8 3,440
HUMBOLDT 10 1,440
WRIGHT 8 2,720
FRANKLIN 12 1,920
BUTLER 11 560
BREMER 8 1,120
BUCHANAN 10 150
DELAWARE
DUBUQUE
WOODBURY 10 370
IDA
SAC 10 400
CALHOUN 12 1,680
WEBSTER 11 2,090
HAMILTON 12 1,560
HARDIN 8 160
GRUNDY
BLACK HAWK
JACKSON
JONES
LINN
BENTON
TAMA
CLINTON
CEDAR
JOHNSON
IOWA
POWESHIEK
SCOTT
MONONA 10 210
CRAWFORD
CARROLL
GREENE 10 1,300
BOONE
STORY
MARSHALL
JASPER
POLK
DALLAS
GUTHRIE
AUDUBON
SHELBY
HARRISON
MUSCATINE
LOUISA
WASHINGTON
KEOKUK
MAHASKA
MARION
WARREN
MADISON
ADAIR
CASS
POTTAWATTAMIE
DES MOINES
HENRY
JEFFERSON
WAPELLO
MONROE
LUCAS
CLARKE
UNION
ADAMS
MONTGOMERY
MILLS
LEE
VAN BUREN
DAVIS
APPANOOSE
WAYNE
DECATUR
RINGGOLD
TAYLOR
PAGE
FREMONT



Tame Hay — 1905 Crop

2.0 LYON 35.700
2.0 OSCEOLA 34.270
2.0 DICKINSON 26.760
1.8 EMMET 31.730
1.6 KOSSUTH 60.190
1.8 WINNEBAGO 31.590
2.0 WORTH 49.660
1.8 MITCHELL 54.060
1.7 HOWARD 56.390
1.8 WINNESHIEK 81.950
ALLAMAKEE 75.830
2.5 SIOUX 52.820
2.0 O'BRIEN 53.700
1.7 CLAY 45.810
1.5 PALOALTO 22.300
2.2 HANCOCK 30.060
1.9 CERRO GORDO 61.570
2.0 FLOYD 61.820
2.0 CHICKASAW 55.350
FAYETTE 104.220
CLAYTON 103.530
1.5 PLYMOUTH 37.790
2.0 CHEROKEE 63.040
1.6 BUENA VISTA 38.620
2.0 POCAHONTAS 36.240
1.8 HUMBOLDT 42.240
2.0 WRIGHT 57.410
1.5 FRANKLIN 44.320
1.7 BUTLER 41.320
2.0 BREMER 43.930
BLACK HAWK 63.660
BUCHANAN
DELAWARE
DUBUQUE
1.8 WOODBURY 38.800
1.8 IDA 45.090
1.5 SAC 51.910
1.6 CALHOUN 36.020
2.0 WEBSTER 54.410
1.8 HAMILTON 54.650
2.0 HARDIN 55.890
1.8 GRUNDY 65.260
2.0 TAMA 120.820
1.6 BENTON
LINN
JONES
JACKSON
2.0 MONONA 19.850
2.0 CRAWFORD 86.440
1.8 CARROLL 53.410
1.3 GREENE 38.330
1.9 BOONE 41.780
2.2 STORY 66.890
2.0 MARSHALL 70.360
1.5 CLINTON 96.190
2.0 HARRISON 38.350
1.8 SHELBY 68.940
1.8 AUDUBON 54.610
1.7 GUTHRIE 61.650
2.0 DALLAS 63.340
2.0 POLK 72.410
1.8 JASPER 96.350
1.8 POWESHIEK 79.410
2.0 IOWA 87.840
JOHNSON 102.130
CEDAR
SCOTT
MUSCATINE
1.8 POTTAWATTAMIE 98.480
2.0 CASS 68.580
1.8 ADAIR 82.030
2.0 MADISON 87.820
1.5 WARREN 66.460
1.8 MARION 66.730
1.8 MAHASKA 70.940
1.5 KEOKUK 65.940
WASHINGTON 50.160
LOUISA
20 MILLS 44.950
2.2 MONTGOMERY 80.800
1.8 ADAMS 59.040
2.0 UNION 93.610
1.5 CLARKE 74.280
1.6 LUCAS 107.260
1.8 MONROE 72.840
1.5 WAPELLO 54.390
JEFFERSON
HENRY
DES MOINES
1.5 FREMONT 27.050
1.5 PAGE 47.430
1.8 TAYLOR 91.990
1.6 RINGGOLD 90.270
1.5 DECATUR 73.550
2.0 WAYNE 141.890
1.5 APPANOOSE 89.800
1.5 DAVIS 86.280
VAN BUREN 83.200
LEE

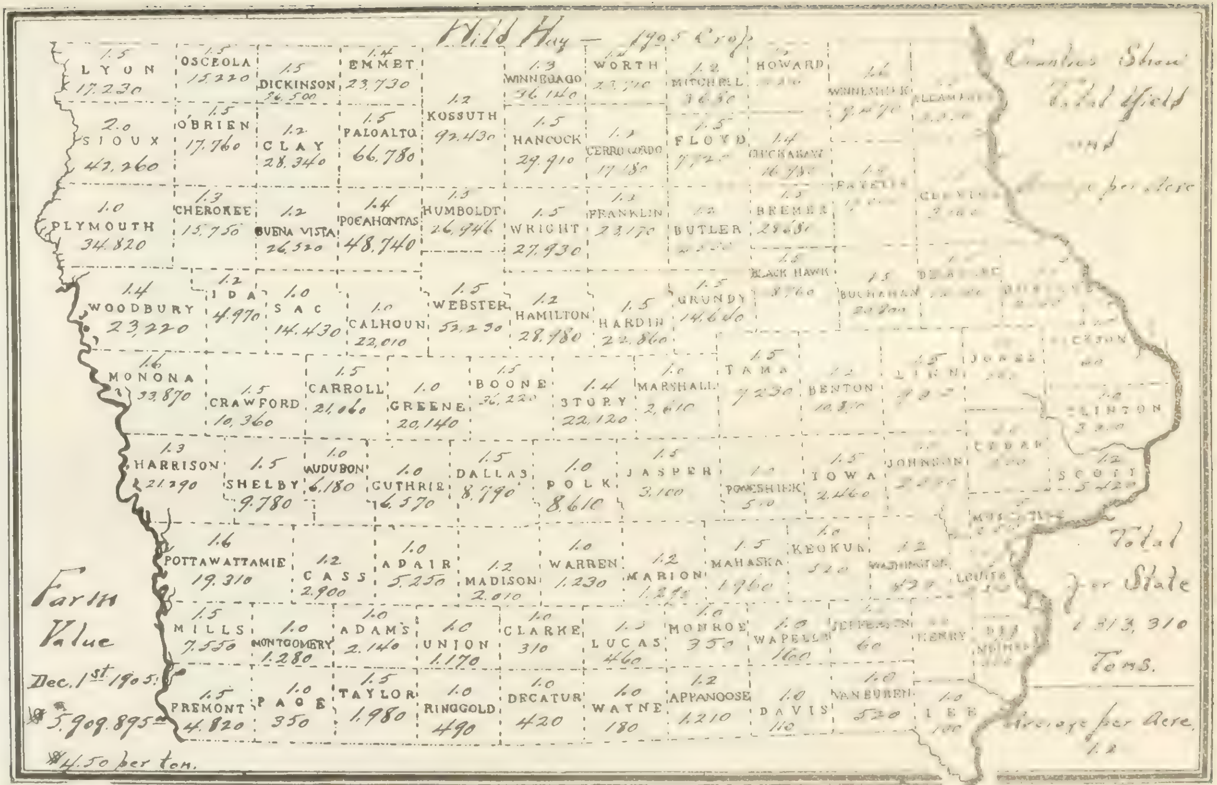
Farm Value Dec. 1st, 1905: $35,625,150.00

$5.50 per ton

Area harvested 3,598,500 acres.

Total for State 6,477,300 Tons

Average per Acre 1.8



Wild Hay — 1905 Crop

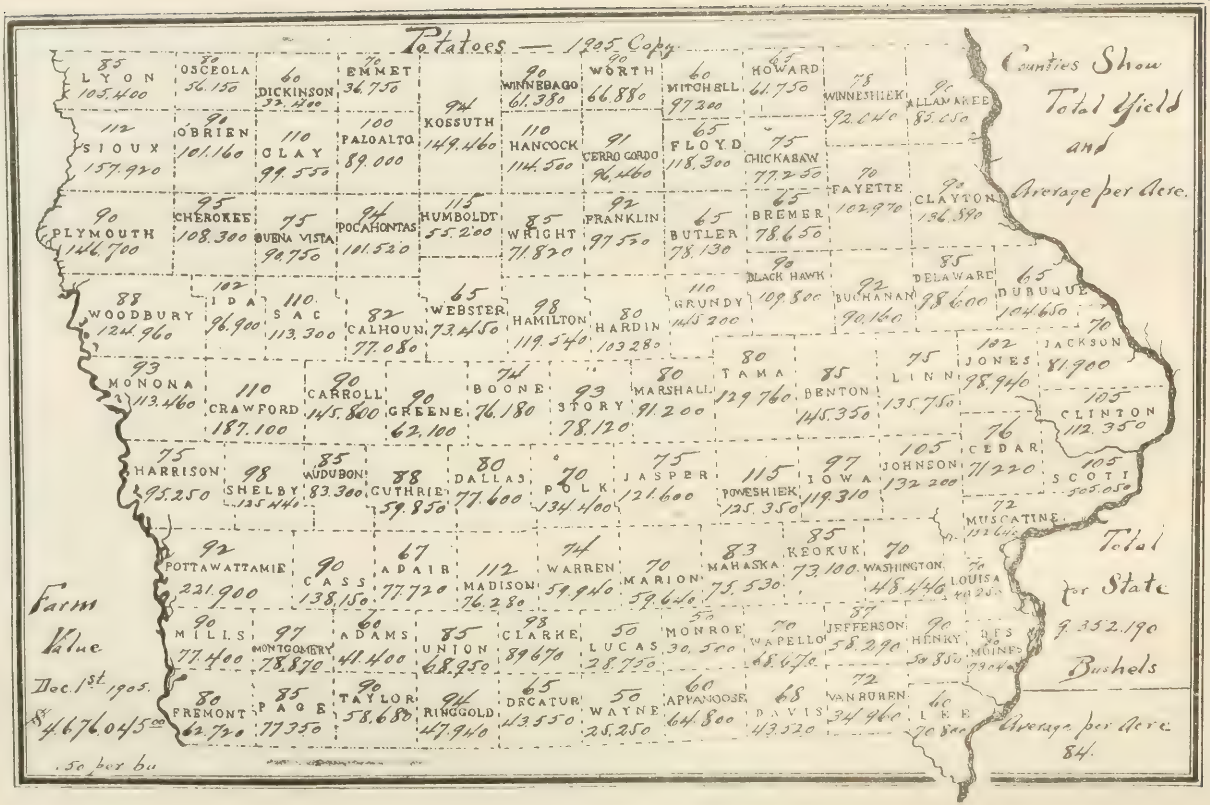
Counties Show Total Yield and Average per Acre

Total for State 1,313,310 Tons.

Average per Acre 1.2

Farm Value Dec. 1st 1905. $5,909,895— $4.50 per ton.

1.5 LYON 17,220
1.5 OSCEOLA 15,220
1.5 DICKINSON 26,500
1.4 EMMET 23,730
1.3 WINNEBAGO 36,140
WORTH
1.2 MITCHELL 36,50
HOWARD
WINNESHIEK 9,470
ALLAMAKEE
2.0 SIOUX 43,260
1.5 OBRIEN 17,760
1.2 CLAY 28,340
1.5 PALOALTO 66,780
1.2 KOSSUTH 92,430
1.5 HANCOCK 29,910
CERRO GORDO 17,180
1.5 FLOYD 7,720
1.4 CHICKASAW 16,780
FAYETTE
CLAYTON
1.0 PLYMOUTH 34,820
1.3 CHEROKEE 15,750
1.2 BUENA VISTA 26,520
1.4 POCAHONTAS 48,740
1.3 HUMBOLDT 26,946
1.5 WRIGHT 27,930
1.3 FRANKLIN 23,170
1.2 BUTLER
1.5 BREMER 29,580
1.5 BLACK HAWK 8,760
1.5 BUCHANAN 20,800
DELAWARE
DUBUQUE
1.4 WOODBURY 23,220
1.2 IDA 4,970
1.0 SAC 14,430
1.0 CALHOUN 22,010
1.5 WEBSTER 53,230
1.2 HAMILTON 28,180
1.5 HARDIN 22,860
1.5 GRUNDY 14,660
1.6 MONONA 33,870
1.5 CRAWFORD 10,360
1.5 CARROLL 21,060
1.0 GREENE 20,140
1.5 BOONE 36,220
1.4 STORY 22,120
1.0 MARSHALL 2,610
1.5 TAMA 7,230
BENTON 10,810
1.5 LINN
JONES
JACKSON
CLINTON
1.3 HARRISON 21,290
1.5 SHELBY 9,780
1.0 AUDUBON 6,180
1.0 GUTHRIE 6,570
1.5 DALLAS 8,790
1.0 POLK 8,610
1.5 JASPER 3,100
POWESHIEK 5.0
1.5 IOWA 2,460
JOHNSON
CEDAR
1.2 SCOTT 5,420
MUSCATINE
1.6 POTTAWATTAMIE 19,310
1.2 CASS 2,900
1.0 ADAIR 5,250
1.2 MADISON 2,010
1.0 WARREN 1,230
1.2 MARION
1.5 MAHASKA 1,960
1.0 KEOKUK 520
1.2 WASHINGTON
LOUISA
1.5 MILLS 7,550
1.0 MONTGOMERY 1,280
1.0 ADAMS 2,140
1.0 UNION 1,170
1.0 CLARKE 310
LUCAS 460
1.0 MONROE 350
1.0 WAPELLO 160
JEFFERSON 60
HENRY
DES MOINES
1.5 FREMONT 4,820
1.0 PAGE 350
1.5 TAYLOR 1,980
1.0 RINGGOLD 490
1.0 DECATUR 420
1.0 WAYNE 180
1.2 APPANOOSE 1,210
1.0 DAVIS 110
1.0 VAN BUREN 520
1.0 LEE 100



Potatoes — 1905 Copy

Counties Show Total Yield and Average per Acre.

Total for State 9.352.190 Bushels

Average per Acre 84.

Farm Value Dec. 1st 1905. $4.676.045.00

.50 per bu

85 LYON 105.400
80 OSCEOLA 56.150
60 DICKINSON 32.400
70 EMMET 36.750
94 KOSSUTH 149.460
90 WINNEBAGO 61.380
90 WORTH 66.880
60 MITCHELL 97200
65 HOWARD 61.750
78 WINNESHIEK 92.040
90 ALLAMAKEE 85.050
112 SIOUX 157.920
90 O'BRIEN 101.160
110 CLAY 99.550
100 PALOALTO 89.000
110 HANCOCK 114.500
91 CERRO GORDO 96.460
65 FLOYD 118.300
75 CHICKASAW 77.250
70 FAYETTE 102.970
90 CLAYTON 136.590
90 PLYMOUTH 146.700
95 CHEROKEE 108.300
75 BUENA VISTA 90.750
94 POCAHONTAS 101.520
115 HUMBOLDT 55.200
85 WRIGHT 71.820
92 FRANKLIN 97520
65 BUTLER 78.130
65 BREMER 78.650
90 BLACK HAWK 109.800
92 BUCHANAN 90.160
85 DELAWARE 98600
65 DUBUQUE 104.650
88 WOODBURY 124.960
102 IDA 96.900
110 SAC 113.300
82 CALHOUN 77.080
65 WEBSTER 73.450
98 HAMILTON 119.540
80 HARDIN 103280
110 GRUNDY 145200
80 TAMA 129760
85 BENTON 145.350
75 LINN 135.750
102 JONES 98.940
70 JACKSON 81.900
93 MONONA 113.460
110 CRAWFORD 187.100
90 CARROLL 145.800
90 GREENE 62.100
74 BOONE 76.180
93 STORY 78.120
80 MARSHALL 91.200
105 CLINTON 112.350
75 HARRISON 95.250
98 SHELBY 125440
85 AUDUBON 83.300
88 GUTHRIE 59.850
80 DALLAS 77.600
70 POLK 134.400
75 JASPER 121.600
115 POWESHIEK 125.350
97 IOWA 119.310
105 JOHNSON 132200
76 CEDAR 71220
105 SCOTT 505.050
72 MUSCATINE 132640
92 POTTAWATTAMIE 221.900
90 CASS 138.150
67 ADAIR 77.720
112 MADISON 76.280
74 WARREN 59.940
70 MARION 59.640
83 MAHASKA 75.530
85 KEOKUK 73.100
70 WASHINGTON 48.446
70 LOUISA 40250
90 MILLS 77.400
97 MONTGOMERY 78.870
60 ADAMS 41.400
85 UNION 68.950
98 CLARKE 89670
50 LUCAS 28.750
50 MONROE 30.500
70 WAPELLO 68.670
57 JEFFERSON 58.290
90 HENRY 50850
70 DES MOINES 73040
80 FREMONT 62.720
85 PAGE 77350
90 TAYLOR 58.680
94 RINGGOLD 47.940
65 DECATUR 43.550
50 WAYNE 25.250
60 APPANOOSE 64.800
68 DAVIS 43.520
72 VAN BUREN 34960
60 LEE 70800

CROP STATISTICS, 1896–1905.

COMPILED FROM ANNUAL REPORTS OF THE IOWA WEATHER AND CROP SERVICE.

Year.	State Averages of Farm Crops 1896-1905; Yield per Acre.								Average Rainfall, Inches, May 1st to September 1st.				
	Corn, bushels.	Spring wheat, bushels.	Oats, bushels.	Barley, bushels.	Rye, bushels.	Flax, bushels.	Potatoes, bushels.	Hay, tons.	May.	June.	July.	August.	Total.
1896	39	13	26	29	16	9.5	87	1.5	6.69	3.11	6.90	3.52	20.22
1897	[illegible]	13.4	[illegible]	[illegible]	15	10	60	1.6	1.92	3.81	3.26	1.80	10.85
1898	34.5	14.8	32	27.5	16	10.5	76	1.7	4.67	4.72	2.98	3.44	15.81
1899	[illegible]	12.7	34	25.6	16.3	11.2	98	1.5	6.23	5.04	3.07	3.68	18.02
1900	40.3	14.3	35	25.3	15.6	11.7	78	1.4	3.31	3.98	6.15	4.65	18.09
1901	26.2	15.3	32	24.2	15.8	8.8	37.4	1.4	2.35	3.71	2.34	1.29	9.69
1902	34	13	31	[illegible]	17	8	91	1.8	5.39	7.16	8.67	6.58	27.80
1903	31	12.6	25.9	24.7	15.6	8.7	53.8	1.5	4.13	4.50	4.23	3.43	12.29
1904	36	9.1	29.4	25	15	11	125	1.5	3.78	3.45	4.41	3.43	15.07
1905	37.2	14.4	33.8	27.5	18	9.8	84	1.8	5.95	5.53	2.91	4.05	18.44
Averages ...	34.3	13.7	30.9	25.8	16.03	9.9	70	1.5					

Total Yield Iowa Staple Crops, 1896–1905.

Year.	Corn, bushels.	Wheat, bushels.	Oats, bushels.	Rye, bushels	Barley, bushels.	Flax, bushels	Potatoes, bushels.	Hay, tons.
1896	312,692,210	10,398,785	73,450,000	1,891,716	15,881,618	1,946,720	14,814,795	5,701,440
1897	239,452,150	14,613,054	132,517,150	3,490,344	14,076,850	2,498,600	10,051,910	5,301,320
1898	289,214,850	22,321,268	139,915,340	3,370,550	14,138,000	2,376,600	12,538,410	5,498,080
1899	306,852,710	19,900,830	140,647,300	2,061,160	14,719,310	1,597,790	15,252,930	5,311,130
1900	345,055,040	21,288,350	138,832,300	1,621,130	12,695,200	1.222,980	10,850,900	5,139,060
1901	227,908,850	18,295,000	114,883,000	859,630	14,654,410	916,890	5,098,460	4,980,380
1902	296,950,230	13,512,840	92,907,900	882,830	15,380,910	755,350	12,051,670	5,641.900
1903	230,511,310	10,916,730	99,012,660	1,923,060	12,179,790	355,160	6,082,694	5,216,404
1904	323,853,330	8,097,430	118,435,570	1,517,090	12,317,710	591,140	14,255.680	4,099,090
1905	345,871,840	6,408,780	146,439,240	1,283,500	15,566,770	173,770	9,352,190	6,477,300
Total	2,918,362,520	145,843,067	1,197,040.460	18,901,010	141,610,768	13,035,000	110,349,839	53,366,074
Average	291,836,252	14,584.306	119,704,046	1,890.101	14,161.076	1.303,500	11,034,983	5,336,607

Average Value of Farm Crops of Iowa—December 1st Prices—1896-1905.

Year.	Corn.		Oats.		Wheat.		Barley.		Rye.		Flax.		Potatoes.		Hay.		Value of total soil products.
	Average per bushel.	Total value.	Average per bushel.	Total value.	Average per bushel.	Total value.	Average per bushel.	Total value.	Average per bushel.	Total value.	Average per bushel.	Total value.	Average per bushel.	Total value.	Average per ton.	Total value.	
1896	$ .14	$ 43,916,900	$ .12	$ 8,814,000	$.57	$ 6,020,000	$.20	$ 3,176,520	$.25	$ 186,080	$ .95	$1,135,006	$.21	$ [illegible]	[illegible]	$ 22,782,600	$ 133,664,620
1897	.17	40,706,860	.16	21,211,380	.74	10,813,650	.23	3,237,670	.31	1,186,710	.87	2,173,782	.15	[illegible]	4.10	22,504,000	151,084,060
1898	.23	66,519,400	.21	29,383,220	.53	11,602,000	.30	4,209,740	.38	1,280,800	.80	1,201,280	.31	5,826,960	4.50	22,281,600	187,455,370
1899	.23	70,429,410	.19	26,722,980	.58	10,701,490	.30	4,415,570	.40	824,460	1.04	1,061,880	.24	3,000,710	5.70	29,350,000	194,605,700
1900	.27	93,164,860	.20	27,766,460	.60	12,799,370	.33	4,189,110	.43	697,360	1.50	1,834,470	.40	1,120,200	7.00	31,120,000	229,809,050
1901	.50	113,954,000	.35	40,209,230	.60	10,965,000	.44	6,447,940	.48	859,650	1.29	916,880	.40	4,588,610	7.70	28,712,600	274,080,930
1902	.28	83,432,700	.24	22,297,000	.53	7,062,640	.33	5,075,710	.40	373,132	1.00	725,376	.34	[illegible]	6.00	26,787,320	215,722,330
1903	.36	82,984,071	.30	29,703,798	.67	7,167,643	.37	4,506,522	.44	816,146	.78	277,021	.75	[illegible]	5.55	25,891,480	256,413,704
1904	.35	113,348,665	.26	30,793,284	.89	7,024,809	.34	4,188,021	.54	819,228	1.15	679,811	.28	3,991,790	5.66	30,197,040	291,207,258
1905	.35	121,055,144	.25	36,609,810	.72	4,611,321	.33	5,137,034	.52	667,420	.90	156,293	.50	1,676,015	5.00	41,535,045	302,286,212
Total.	.....	$829,512,010	.....	$277,511,162	...	$ 88,770,923	....	$ 44,563,937	...	$8,018,506	.....	$1,291,890	.	$ 40,128,19[illegible]	. .	$310,959,885	$2,236,329,234
Averages	$ .28	$ 82,951,201	$ .22	$ 27,751,116	$.64	$ 8,877,092	$.31	$ 4,456,393	$.41	$ 801,850	$1.02	$ 129,189	$.43	$ 4,012,819	$5.26	$ 31,095,988	$ 223,632,923

MONTHLY AND ANNUAL PRECIPITATION FOR THE STATE, 1896 1905

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Inches. Winter months.	Spring months.	Summer months.	Autumn months.
[illegible]	0.48	0.71	1.10	[illegible]	6.68	3.10	6 90	3 52	4 09	3 13	1 83	0.65	37.23	1.84	12 81	13.53	9 05
[illegible]	2.01	0.88	2.39	[illegible]	1.92	3.81	3.26	1.86	2 04	1 14	0 66	1 65	26 97	4.54	[illegible]	8 93	[illegible]
[illegible]	[illegible]	1.20	1.94	[illegible]	4.67	4.72	2.98	3.44	2 69	3.56	2 50	0 48	31.34	3 28	9 17	11 14	7.75
1899	[illegible]	[illegible]	1 62	[illegible]	6.23	5 04	3 07	3.68	0 93	[illegible]	1 20	1 61	28 68	[illegible]	10.25	11 79	3.86
[illegible]	0.53	1 30	2 06	[illegible]	3.31	3 98	6.15	4.65	4.08	3 91	1 06	0 45	34.15	2.28	8 04	14 78	9 05
1901	0.47	1.01	2.64	[illegible]	2.35	[illegible]	2.34	1 29	4.77	1 98	0 86	[illegible]	[illegible]	2.68	6 78	7.34	7.61
1902	0 88	0 73	1.45	[illegible]	5.39	[illegible]	8 67	6 58	4 35	2.54	[illegible]	[illegible]	[illegible]	3 84	[illegible]	22 41	[illegible]
[illegible]	0 28	[illegible]	1 38	[illegible]	8 55	2 86	[illegible]	6 64	3 81	1.95	0.52	0 41	35 39	1 87	12 91	14.33	6.28
1904	1.18	[illegible]	2 18	[illegible]	[illegible]	3 45	4 41	3 43	2 78	1.67	[illegible]	1.44	28.51	3 03	9 59	11 29	4 60
1905	0 91	[illegible]	2.04	[illegible]	[illegible]	[illegible]	[illegible]	4 05	3 81	3 40	2 84	0.52	36 56	3 00	11 02	12 49	10 05
Averages	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.55	3 91	3 33	2 50	1 37	1 03	32.70	2 91	9 87	[illegible]	7 11

Acreage, Production, and Value of the Principal

State and Territories.	CORN.					WINTER	
	Acreage.	Yield per Acre.	Production.	Price per Bush.	Total Farm Value.	Acreage.	Yield per Acre.
	Acres.	*Bush.*	*Bushels*	*Cents.*	*Dollars.*	*Acres.*	*Bush.*
Maine	13,000	34.3	445,900	69	307,671	....	....
New Hampshire	27,045	37.0	1,000,665	69	690,459	....	....
Vermont	58,238	34.7	2,020,859	68	1,374,184	....	....
Massachusetts	44,799	37.5	1,679,962	70	1,175,973	....	....
Rhode Island	10,011	32 5	325,358	71	231,004	....	....
Connecticut	55,595	42.7	2,373,906	71	7,685,473	....	....
New York	613,103	31.5	19,317,744	61	11,780,774	490,521	21.0
New Jersey	277,749	35.8	9,943,414	55	5,468,878	110,075	16.4
Pennsylvania	1,441,797	38.9	56,085,903	54	30,286,388	1,629,279	17.1
Delaware	196,472	30.4	5,972.749	47	2,807,192	121,001	13.8
Maryland	628,795	36.9	23,202,536	48	11,137,217	809,619	16.3
Virginia	1,859,610	23.4	43,514,874	53	23,062,883	738,480	11.4
North Carolina	2,704,772	13.9	37,596,331	64	24,061,652	593,325	6.7
South Carolina	1,878,978	10.9	20,480,860	74	15,155,836	318,419	6.1
Georgia	4,295,924	11.0	47,255,164	70	33,078,615	305,298	6.9
Florida	645,416	10.1	6,518,702	66	4,302,343	....	....
Alabama	2,903,483	14.8	42,971,548	64	27,501,791	108,446	9.6
Mississippi	2,099,830	14.3	30,027,569	65	19,517,920	2,619	10.8
Louisiana	1,424,562	13.7	19,516,499	61	11,905,064	....	....
Texas	6,532,695	21.3	139,146,404	49	68,181,738	1,249,207	8.9
Arkansas	2,215,245	17.3	38,323,738	55	21,078,056	198,077	7.9
Tennessee	3,138,533	24.6	77,207,912	50	38,603,956	881,750	7.2
West Virginia	765,541	29.8	22,813,122	53	12,090,955	355,535	12.3
Kentucky	3,195,072	29.7	94,893,638	43	40,804,264	779,642	11.3
Ohio	2,973,529	37.8	112,399.396	43	48,331,740	1,882,907	17.1
Michigan	1,228,704	34.0	41,775,936	46	19,216,931	1,027,204	18.5
Indiana	4,597,804	40.7	187,130,623	38	71,109,637	1,931,774	18.3
Illinois	9,616,886	39.8	382,752,063	38	145,445,784	1,871,974	16.0
Wisconsin	1,473,613	37.6	55,407,849	42	23,271,297	117,794	19.2
Minnesota	1,507,614	32.5	48,997,455	33	16,169,160	....	....
Iowa	9,285,150	37.2	345,871,840	35	121,055,144	62,030	20.2
Missouri	6,014,639	33.8	203,294,798	37	75,219,075	2,259,866	12.4
Kansas	6,977,467	27.7	193,275,836	33	63,781,026	5,289,740	13.9
Nebraska	8,035,115	32.8	263,551,772	32	84,336,567	2,091,393	20.4
South Dakota	1,623,105	31.8	51,614,739	31	16,000,569	....	....
North Dakota	89,405	27.5	2,458,638	36	885,110	....	....
Montana	3,941	19 4	76,455	68	51,989	....	....
Wyoming	2,107	26.9	56,678	75	42,508	....	....
Colorado	116,659	23.8	2,776,484	47	1,304,947	....	....
New Mexico	39,423	25.3	997,402	69	688,207	....	....
Arizona	7,614	27.0	205,578	97	199,411	....	....
Utah	11,353	36.2	410,979	70	287,685	....	....
Nevada	....	....	....	......	....	......	....
Idaho	5,506	27.2	149,763	66	98,844	196,066	32.0
Washington	10,796	24.2	261,263	60	156,758	478,647	28.3
Oregon	17,556	23.0	403,788	59	238,235	372,852	21.1
California	56,592	32.0	1,810,944	76	1,376,317	1,886,238	9.3
Oklahoma	1,902,948	25.3	48,144,584	32	15,406,267	1,434,648	8.2
Indian Territory	1,905,131	32.7	62,297,784	37	23,050,180	270,261	10.0
United States	94,528,922	28.8	2,748,753,004	41.2	1,134,011,674	29,864,687	14.3

Farm Crops of the United States in 1905.

WHEAT,			SPRING WHEAT.				
Production.	Price per Bush.	Total Farm Value.	Acreage.	Yield per Acre.	Production.	Price per Bush.	Total Farm Value.
Bushels.	*Cents.*	*Dollars.*	*Acres.*	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*
...	...	...	7,780	23.0	181,240	106	192,114
...	...	...	...	...	...	...	...
...	...	...	1,461	18.8	24,467	99	24,720
...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...
10,300,941	86	8,858,809	...	...	...	...	...
1,805,230	88	1,588,602	...	...	...	...	...
27,860,671	87	24,238,784	...	...	...	...	...
1,669,814	82	1,369,247	...	...	...	...	...
13,196,790	82	10,821,368	...	...	...	...	...
8,418,672	88	7,408,431	...	...	...	...	...
3,975,278	102	4,054,784	...	...	...	...	...
1,942,356	111	2,156.015	...	...	...	...	...
2,106,556	107	2,254,015	...	...	...	...	...
...	...	...	...	...	...	...	...
1,041,082	101	1,051,493	...	...	...	...	...
28,285	95	26,871	...	...	...	...	...
...	...	...	...	...	...	...	...
11.117,942	88	9,783,789	...	...	...	...	...
1,564,808	90	1,408,327	...	...	...	...	...
6,348,600	91	5,777,226	...	...	...	...	...
4,373,080	89	3,892,041	...	...	...	...	...
8,809,955	87	7,664,661	...	...	...	...	...
32,197,710	82	26,402,122	...	...	...	...	...
19,003,274	79	15,012,586	...	...	...	...	...
35,351,464	82	28,988,200	...	...	...	...	...
29,951,584	81	24,260,783	...	...	...	...	...
2,261,645	76	1,718,850	356,439	15.8	5,631,736	76	4,280,119
...	...	...	5,446,183	13.3	72,434,234	71	51,428,306
1,253,020	72	902,174	358,003	14.4	5,155,760	72	3,712,147
28,022,338	79	22,137,647	...	...	...	...	...
73,527,386	71	52,204,444	246,363	14.1	3.473.718	71	2,466,340
42,664,417	66	28,158,515	381,299	14.0	5,338,186	66	3,523,203
...	...	...	3,221,422	13.7	44,133,481	67	29,569,432
...	...	...	5,401,646	14.0	75,623,044	69	52,179,900
...	...	...	119,469	23.8	2,843,362	71	2,018,787
...	...	...	29,468	25.4	748,487	72	538,911
...	...	...	254,355	25.0	6,358,875	70	4,451,212
...	...	...	42,691	22.2	947,740	90	852,966
...	...	...	14,802	22.4	331,565	117	387,931
...	...	...	178,417	26.4	4,710,209	67	3,155,840
...	...	...	26,800	27.0	723,600	77	557,172
6,274,112	66	4,140,914	170,900	23.8	4,067,420	65	2,643,823
13,545,710	65	8,804,712	843,160	22.5	18,971,100	66	12,520.926
7,867,177	68	5,349,680	344,713	16.0	5,515,408	68	3,750,477
17,542,013	82	14,384,451	...	...	...	...	...
11,764,114	69	8,117,239	...	...	...	...	...
2,702,610	77	2,081,010	...	...	...	...	...
488,488,634	78.2	325,171,790	17,445,471	14.7	257,216,632	69.3	178,254,520

Acerage, Production and Value of the Principal Farm

States and Territories.	OATS.					BAR-	
	Acreage.	Yield per Acre,	Production.	Price. per Bush.	Total Farm Value.	Acreage.	Yield per Acre.
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*Acres.*	*Bush.*
Maine	112,817	39.5	4,343,454	43	1,867,685	7,817	29.0
New Hampshire	12,174	32.8	399,307	43	171,702	1,522	20.8
Vermont	78,526	39.4	3,093,924	40	1,237,570	12,939	31.5
Massachusetts	6,372	32.0	203,904	43	87,679	....	....
Rhode Island	1,604	29.4	47,158	42	19,806	....	....
Connecticut	10,077	34.5	347,656	42	146,016	....	....
New York	1,258,210	34.2	43,030,782	37	15,921,389	90,729	25.7
New Jersey	62,512	32.0	2,000,384	37	740,142	......	......
Pennsylvania	1,161,186	34.0	39,480,324	36	14,212,917	8,692	25.0
Delaware	4,124	31.2	128,669	40	51,468	......	..
Maryland	33,160	27.7	918,532	36	330,672	1,436	31.0
Virginia	176,459	17.8	3,140,970	39	1,224,978	2,472	28.0
North Carolina	203,815	15.3	3,118,370	47	1,465,634	....	....
South Carolnia	187,509	16.3	3,056,397	55	1,681,018	....	....
Georgia	233,250	15.1	3,522,075	53	1,866,700	....	....
Florida	29,957	12.0	359,484	52	186,932	....	....
Alabama	191,853	16.5	3,165,574	51	1,614,443	....	....
Mississippi	90,374	18.5	1,671,919	50	835,960	....	....
Louisiana	27,715	16.0	443,440	45	199,548	....	....
Texas	914,440	31.4	28,713,416	40	11,485,366	4,843	24.0
Arkansas	192,261	20.3	3,902,898	42	1,639,217	....	....
Tennessee	151,106	20.2	3,052,341	39	1,190,413	1,161	21.6
West Virginia	82,182	24.1	1,980,586	39	772,429	....	....
Kentucky	223,982	25.5	5,487,559	35	1,920,646	748	24.0
Ohio	1,061,260	35.8	37,993,108	31	11,777,863	23,165	26.2
Michigan	1,009,802	35.6	35,948,951	30	10,784,685	33,499	27.0
Indiana	1,343,706	35.3	47,432,822	27	12,806,862	9.429	28.0
Illinois	3,740,275	35.5	132,779,762	28	37,178,333	24,093	30.0
Wisconsin	2,527,692	39.0	98,579,988	27	26,616,597	493,063	29.9
Minnesota	2,151,192	37.5	80,669,700	24	19,360,728	1,074,538	27,0
Iowa	3,939,200	33.8	146,439,240	25	36,609,810	566,420	27.5
Missouri	723,709	27.2	19,684,885	30	5,905,466	1,852	23.0
Kansas	857,868	27.1	23,248,223	28	6,509,502	152,929	22.0
Nebraska	1,886,270	31.0	58,474,370	24	14,033,849	66,498	27.5
South Dakota	720,603	39.0	28,103,517	23	6,463,809	332,080	30.0
North Dakota	1,197,799	38.9	46,594,381	23	10,716,708	690,223	28.0
Montana	178,911	41.3	7,389,024	43	3,177,280	15,227	33.0
Wyoming	45,548	39.9	1,817,365	41	745,120	1,188	31.7
Colorado	137,929	35.0	4,827,515	41	1,979,281	18,909	33.0
New Mexico	11,912	29.5	351,404	58	203,814	604	21.0
Arizona	879	31.2	27,425	64	17,552	14,893	44.0
Utah	44,067	39.8	1,753,867	44	771,701	7,799	37.0
Nevada	6,267	37.2	233,132	52	121,229	6,883	34.0
Idaho	98,058	39.4	3,863,485	42	1,622,664	66,153	40.0
Washington	164,540	50.0	8,227,000	41	3,373,070	169,314	40.0
Oregon	281,842	24.1	6,792,392	43	2,920,729	50,862	31.0
California	168,755	28.0	4,725,140	51	2,409,821	1,237,533	21.5
Oklahoma	294,442	33.0	9,716,586	29	2,817,810	14,920	26.0
Indian Territory	201,607	36.0	7,257,852	33	2,395,091	....	....
United States	28,239,798	34.0	968,540,257	29.1	282,191,704	5,173,433	26.8

Crops of the United States in 1905—CONTINUED.

LEY.			RYE.				
Production	Price per Bush.	Total Farm Value.	Acreage.	Yield per Acre.	Production.	Price per Bush.	Total Farm Value.
Bushels.	*Cents.*	*Dollars.*	*Acres.*	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*
226,693	68	154,151	....	....	....	....	....
31,658	73	23,110	....	....	....	....	....
507,578	54	274,092	1,772	15.0	26,580	65	17,277
....	....	....	3,938	15.5	61,039	79	48,221
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....
2,331,735	54	1,259,137	135,374	16 0	2,165,984	67	1,451,209
....	....	....	78,363	18.0	1,410,534	66	930,952
217,300	55	119,515	346,265	17.0	5,886,505	65	3,826,228
....	....	....	....	....	....	....	....
44,516	48	21,368	....	....	....	....	....
69,216	55	38,069	17,642	11.8	208,176	71	147,805
....	....	....	17,334	9.5	164,673	86	141,619
....	....	....	4,226	8.1	34,231	119	40,735
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....
116,232	66	76,713	....	....	....	....	....
....	....	....	2,075	12.0	24,900	93	23,157
25,078	57	14,294	10,346	12.1	125,187	77	96,394
....	....	....	....	....	....	....	....
17,952	44	7,899	11,861	15.0	177,915	71	126,320
606,923	45	273,115	11,686	18.0	210,348	62	130,416
904,473	47	425,102	134,100	16.0	2,145,600	59	1,265,904
264,012	45	118,805	27,535	15.4	424,039	60	254,423
722,790	42	303,572	71,471	18 0	1,286,478	60	771,887
14,742,584	41	6,044,459	290,682	16.5	4,796,253	59	2,829,789
29,012,526	32	9,284,008	87,572	18.2	1,593,810	53	844,719
15,566,770	33	5,137,034	71,305	18	1,283,500	52	667,420
42,596	44	18,742	17,481	15.5	270,956	62	167,993
3,364.438	32	1,076,620	66,815	15.7	1,048,996	54	566,458
1,828,695	31	566,895	125,611	18.0	2,260,998	48	1,085,279
9,962,400	29	2,889,096	31,812	19.0	604,428	49	296,170
19,326,244	30	5,797,873	21,284	19.5	415,038	50	207,519
502,491	56	281,395	1,871	20.0	37,420	65	24,323
37,660	59	22,219	428	23.0	9,844	62	6,103
623,997	53	330,718	2,368	19.0	44,992	56	25,196
12,684	69	8,752	....	....	....	....	....
655,292	81	530,787	....	....	....	....	....
288,563	53	152,938	3,701	18.0	66,618	65	43,302
234,022	70	163,815	....	....	....	....	....
2,646,120	48	1,270,138	1,500	25.0	37,500	56	21,000
6,772,560	47	3,183,103	2,625	18.5	48,562	70	33,993
1,855,722	52	964,975	10,690	15.0	160,350	81	129,884
26,606,960	59	15,698,106	67,402	13.0	876,226	77	674,694
387,920	40	155,168	....	....	....	....	....
....	....	....	....	....	....	....	....
140,556,380	40.3	56,383,783	1,677,135	16.6	27,907,480	60.7	16,896,389

Acreage, Production, and Value of the Principal Farm Crops of the United States in 1905—Continued.

States and Territories	BUCKWHEAT.					FLAXSEED.				
	Acreage.	Yield per acre.	Production.	Price per bu.	Total farm value.	Acreage.	Yield per acre.	Production.	Price per bush.	Total farm value.
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*Acres.*	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*
Maine	23,013	30.0	690,390	65	448,754	...	...	...	...	...
New Hampshire	1,932	23.0	44,436	71	31,,550	...	...	...	...	...
Vermont	8,027	19.0	152,513	51	77 782	...	...	...	...	...
Massachusetts	2,407	20.0	48,140	71	34,179	...	...	...	...	...
Rhode Island	...	...	...	...	...	...	...	...	...	...
Connecticut	3,454	16.0	55,264	73	40,343	...	...	...	...	...
New York	331,497	19.0	6,298,443	59	3,716,081	...	...	...	...	...
New Jersey	11,835	21.0	248,535	63	156,577	...	...	...	...	...
Pennsylvania	232,398	20.0	4,647,960	56	2,602,858	...	...	...	...	...
Delaware	1,416	17.0	24,072	57	13,721	...	...	...	...	...
Maryland	8,124	19.0	154,356	63	97,244	...	...	...	...	...
Virginia	18,637	18.0	335,466	62	207,989	...	...	...	...	...
North Carolina	5,776	15.0	86,640	66	57,182	...	...	...	...	...
South Carolina	...	...	...	...	...	...	...	...	...	...
Georgia	...	...	...	...	...	...	...	...	...	...
Florida	...	...	...	...	...	...	...	...	...	...
Alabama	...	...	...	...	...	...	...	...	...	...
Mississippi	...	...	...	...	...	...	...	...	...	...
Louisiana	...	...	...	...	...	...	...	...	...	...
Texas	...	...	...	...	...	...	...	...	...	...
Arkansas	...	...	...	...	...	...	...	...	...	...
Tennessee	532	16.0	8,512	68	5,788	...	...	...	...	...
West Virginia	21,131	19.0	401,489	66	264,983	...	...	...	...	...
Kentucky	...	...	...	...	...	...	...	...	...	...
Ohio	8,170	17.0	138,890	62	86,112	...	...	...	...	...
Michigan	33,332	16.0	533,312	53	282,655	...	...	...	...	...
Indiana	5,018	17.0	85,306	65	55,449	...	...	...	...	...
Illinois	4,208	16.0	67,328	68	45,783	...	...	...	...	...
Wisconsin	23,158	15.0	347,370	56	194,527	29,847	13.0	388,011	91	353,090
Minnesota	4,538	14.0	63,532	57	36,213	449,008	11.3	5,073,790	86	4,363,459
Iowa	7,294	12.0	94,822	70	66,375	17,735	9.8	173,710	90	156,393
Missouri	1,853	16.0	29,648	82	24,311	40,789	7.8	318,154	87	276,794
Kansas	1,498	11.0	16,478	69	11,370	110,555	8.0	884,440	83	734,085
Nebraska	870	14.0	12,180	63	7,673	18,433	10.2	188,017	88	165,455
South Dakota	...	...	...	...	...	405,845	11.2	4,545,464	83	3,772,735
North Dakota	...	...	...	...	...	1,357,171	11.6	15,743,184	84	13,224,274
Montana	...	...	...	...	...	16,570	10.0	165,700	82	135,874
Wyoming	...	...	...	...	...	...	...	...	...	...
Colorado	...	...	...	...	...	...	...	...	...	...
New Mexico	...	...	...	...	...	...	...	...	...	...
Arizona	...	...	...	...	...	...	...	...	...	...

Utah										
Nevada										
Idaho						22,848	9.8	223,910	92	205,997
Washington										
Oregon						2,276	12.0	27,312	106	28,951
California										
Oklahoma										
Indian Territory						6,615	10.0	66,150	82	51,243
United States	760,118	19.2	14,585,082	58.7	8,565,499	2,477,692	11.2	27,797,642	81.1	23,170,354

	POTATOES (Irish,)					HAY.				
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*Acres.*	*Tons.*	*Tons.*	*Dollars*	*Dollars.*
Maine	103,317	175	18,080,475	61	11,029,090	1,303,760	1.08	1,408,061	9.90	13,939,804
New Hampshire	19,723	120	2,366,760	72	1,704,067	619,530	1.16	718,655	13.00	9,342,515
Vermont	26,566	98	2,603,468	71	1,848,462	861,911	1.35	1,163,580	9.43	10,972,559
Massachusetts	29,443	97	2,855,971	84	2,399,016	577,061	1.33	767,491	15.22	11,681,213
Rhode Island	6,490	125	811,250	89	722,012	61,980	1.09	67,558	16.27	1,099,169
Connecticut	31,931	92	2,937,652	91	2,673,263	481,751	1.12	542,921	14.60	7,926,647
New York	428,986	70	30,029,020	70	21,020,314	4,717,641	1.30	6,132,933	10.38	63,659,845
New Jersey	65,391	93	6,081,363	75	4,561,022	420,322	1.13	474,964	14.81	7,034,217
Pennsylvania	253,797	90	22,841,730	65	14,847,124	3,072,021	1.50	4,608,032	11.93	54,973,822
Delaware	7,677	93	718,961	59	421,237	75,549	1.55	117,101	13.67	1,600,771
Maryland	29,041	95	2,758,895	58	1,600,159	286,011	1.30	371,814	11.92	4,432,023
Virginia	55,105	84	4,628,820	56	2,592,139	440,467	1.30	572,607	12.62	7,226,300
North Carolina	25,883	77	1,992,991	68	1,355,234	125,633	1.60	201,013	12.80	2,572,966
South Carolina	9,250	83	767,750	103	790,782	59,492	1.42	84,479	13.36	1,128,639
Georgia	8,627	65	560,755	112	628,016	88,054	1.50	132,081	15.75	2,080,276
Florida	4,110	75	308,250	120	369,900	12,999	1.48	19,239	16.25	312,634
Alabama	9,544	80	763,520	88	671,898	55,245	1.90	104,966	12.52	1,314,174
Mississippi	5,863	110	644,930	85	548,190	43,013	1.75	75,273	11.17	840,799
Louisiana	9,146	64	585,344	91	532,663	21,488	2.30	49,422	11.50	568,353
Texas	34,940	64	2,236,160	93	2,079,629	395,663	1.90	751,760	8.12	6,104,291
Arkansas	21,934	65	1,425,710	73	1,040,768	74,665	1.75	130,664	9.60	1,254,374
Tennessee	23,600	80	1,888,000	58	1,095,040	339,446	1.60	543,114	11.52	6,256,673
West Virginia	34,376	88	3,025,088	58	1,754,551	522,610	1.48	773,463	11.65	9,010,844
Kentucky	35,445	85	3,012,825	53	1,596,797	461,033	1.30	599,343	10.63	6,371,016
Ohio	161,930	78	12,630,540	63	7,957,240	2,632,049	1.49	3,921,753	8.00	31,374,024
Michigan	241,836	67	16,203,012	56	9,073,687	2,084,345	1.46	3,043,144	7.70	23,432,209
Indiana	77,818	80	6,225,440	58	3,610,755	1,716,132	1.48	2,539,875	7.54	19,150,658
Illinois	149,147	75	11,186,025	67	7,494,637	2,664,682	1.35	3,597,321	8.27	29,749,845
Wisconsin	237,497	68	16,149,796	62	10,012,874	1,789,994	1.80	3,221,989	7.25	23,359,420
Minnesota	134,471	82	11,026,622	50	5,513,311	858,465	1.75	1,502,314	5.80	8,713,421
Iowa	114,216	84	9,352,190	50	4,676,045	5,193,740	1.50	7,790,610	5.00	11,539,045
Missouri	86,089	82	7,059,298	55	3,882,614	2,812,731	1.10	3,094,004	7.84	24,256,991
Kansas	68,564	81	5,553,684	69	3,832,042	1,759,341	1.55	2,726,979	5.08	13,853,053
Nebraska	87,144	93	8,104,392	37	2,998,625	601,974	1.75	1,053,454	4.14	4,361,300

Acreage, Production, and Value of the Principal Farm Crops of the United States in 1905—Continued.

States and Territories.	POTATOES (IRISH).					HAY.				
	Acreage.	Yield per acre.	Production.	Price per bush.	Total farm value.	Acreage.	Yield per acre.	Production.	Price per ton	Total farm value.
South Dakota	35,071	96	3,366,816	38	1,279,390	212,906	1.60	340,650	4.02	1,369,413
North Dakota	25,425	95	2,415,375	38	917,842	164,230	1.55	254,556	4.33	1,102,227
Montana	13,688	120	1,642,560	59	969,110	362,939	1.60	580,702	7.70	4,471,405
Wyoming	4,002	170	680,340	56	380,990	171,206	2.50	428,015	6.21	2,657,973
Colorado	51,052	160	8,168,320	57	4,655,942	665,226	2.65	1,762,849	8.20	14,455,362
New Mexico	1,170	75	110,250	89	98,122	79,087	2.70	213,535	10.75	2,295,501
Arizona	....	...	......	.....	....	63,685	3.75	238,819	12.37	2,954,191
Utah	12,358	132	1,631,256	43	701,440	351,272	3.25	1,141,634	6.67	7,614,699
Nevada	2,806	120	336,720	82	276,110	159,042	2.50	397,605	8.50	3,379,642
Idaho	11,782	140	1,649,480	48	791,750	382,467	3.10	1,185,648	5.90	6,995,323
Washington	34,199	142	4,856,258	46	2,233,879	341,990	2.65	906,274	9.67	8,763,670
Oregon	40,488	110	4,453,680	60	2,672,208	390,076	2.30	897,175	7.74	6,944,134
California	50,291	165	8,298,015	67	5,559,670	589,119	2.40	1,413,886	10.05	14,209,554
Oklahoma	10,935	77	841,995	88	740,956	305,070	1.43	436,250	4.91	2,141,988
Indian Territory	12,497	76	949,772	82	778,813	45,235	1.27	57,448	5.35	307,347
United States	2,941,961	87.0	256,612,464	61.7	158,989,455	41,517,348	1.54	63,157,033	8.52	531,156,319

PART III.

LIVE STOCK AND FARM STATISTICS.

COMPILED FROM THE

STATE CENSUS OF 1905.

Believing that the readers of the Year Book will be interested in the valuable statistical information relative to the agricultural and stock raising interests of the state contained in the State Census of Iowa for the year of 1905,—a feature heretofore never embodied in that publication—we reproduce a part of same herewith, after having assimilated the different tables in groups and adding additional features thereto which we believe will materially increase their value.

Following is a brief summary of the contents of the different tables arranged in their respective groups:

GROUP I.

Table I.—Farms occupied by owners. Shows number of farms, total acreage, average acreage, value of land, building and farm implements.

Table II.—Farms occupied by renters. Contains same information as table I.

(It is interesting to know from tables I and II that sixty-five per cent of the total number of farms are occupied by owners)

Table III.--Grand Totals. Showing number of farms, acres, value of land buildings and farm implements, with grand total of all. (This table shows the average size of the Iowa farm to be 158½ acres, with an average value of $56.00 per acre.)

GROUP II.

The five tables contained in this group deal with the farm crops for the season of 1904. Crop reports for that season were published in the 1904 Year book and vary somewhat from the reports returned by the census enumerators. However, it was thought advisable to publish these tables for the purpose of having a record in the Year Book of the acreage, and more especially the acreage of certain farm crops which have not been of record heretofore. The total acreage of crops as shown by these tables follows:

Corn	9,542,956
Oats	4,315,637
Wheat	517,274
Barley	424,580
Rye	66,065
Buckwheat	10,590
Clover	207,171
Timothy	3,314,149
Wild Hay	996,122
Millet	66,821
Alfalfa	10,351
Potatoes	133,270
Pasturage	12,823,123
Miscellaneous	800,000
Total Acres	33,228,109

Table No. I.—Corn and Wheat. Shows total acreage, number of bushels and value of same.

Corn: Total value is based on an average price of 34 cents per bushel, which figures an average value of $12.33¼ per acre.

Wheat: Total value is based on an average price of 81½ cents per bushel, which figures an average value of $9.45 per acre.

Table No. II.—Oats and Barley. Shows total acreage, number of bushels and value of same.

Oats: Total value based on average price of 25½ cents per bushel, which gives an average value of $7.94 per acre.

Barley: Total value based on average price of 34 cents per bushel, which gives an average value of a fraction less than $12.57 per acre.

Tables No's 3, 4 and 5.—Rye, Buckwheat, Clover, Timothy, Millet, Alfalfa, Wild Hay, Other Forage Crops, Flax Seed, Clover Seed, Timothy Seed, other Grass Seeds, Irish Potatoes, Sweet Potatoes and Sweet Corn. Shows total acreage, number of bushels and value of same.

GROUP III

Table No. I.—Horticultural statistics. Gives value of the principal fruits produced, together with total value of all.

GROUP IV.

Map showing number and value of all kinds of cattle in state, by counties

Table No. I.—Calves under one year, steers one year and under two and steers two year and under three; their number, value and average value per head for the state.

Table No. II.—Steers three years old and over, bulls one year old and over and heifers one year old and under two; their number, value and average value per head for the state.

Map showing total number and value of all steers in the state and number in counties.

Table No. III—Milch cows two year old and over, cows other than milch, and grand total number and value of all cattle in state and by counties, together with average value per head for state.

Table No. IV—Cattle eligible to registry. Gives total number and value by (leading) breeds in state and counties, together with average value per head for state.

GROUP V.

Table No. I—Horses—Colts under one year, horses one year and under two, two years and over; their total number and value for state and by counties, together with average values in state and grand total and average price per head for state.

Table No. II—Horses eligible to registry. Clydesdale, Percheron, Belgian, Coach, Standard Bred and other breeds, showing total number, value and average value by state and counties, with grand total number and value and average value per head for state.

GROUP VI.

Map showing total number and value of all swine in the state and number in counties.

Table No. 1—Swine. Showing total number and value together with average value per head for state, and swine eligible to registry by breeds in state and counties and average value thereof.

GROUP VII.

Map showing total number and value of all sheep in the state and number in counties.

Table No. 1—Sheep. Shows total number and value of all ages and sex for state and by counties, with average value per head and grand totals, also;

Sheep Eligible to Registry, showing number and value of the leading breeds for state and by counties, and average value per head.

GROUP VIII.

Table No. 1—Mules, Asses, Goats and Other Farm Animals; their total number and value and average value per head for state.

GROUP IX.

Table No. 1—Chickens and other fowls; their total number and value for state and by counties, and average value for state; also

Eggs: Number produced and value for state and by counties and average price for state; also

Vegetables: Value for state and by counties.

GROUP I.

TABLE NO. I.

Number of Farms, Acres Owned, Value of Land, Buildings and Farm Implements Owned or Occupied by Owners or Renters and Grand Total by Counties.

County.	Farms Owned by Occupants.				
	Number.	Acres owned.	Land value including acres rented.	Value buildings.	Value farm implements.
Total for State	*138,224*	*19,882,464*	*$984,204,235*	*$218,813,327*	*$27,749,330*
Average.		*144*			
Adair	1,394	196,092	$ 9,747,847	$ 1,815,442	$ 214,434
Adams	1,174	163,575	7,419,665	1,490,621	179,985
Allamakee	1,959	312,435	7,611,100	2,462,606	405,127
Appanoose	1,648	212,577	6,746,535	1,385,131	359,860
Audubon	1,206	178,600	10,916,273	1,705,342	263,021
Benton	1,503	205,795	16,052,780	3,102,320	344,463
Black Hawk	1,314	180,099	11,779,361	2,636,442	353,874
Boone	1,407	173,297	10,073,856	2,085,666	264,304
Bremer	1,361	189,397	8,267,938	2,614,616	378,300
Buchanan	1,497	197,237	9,978,165	2,068,514	240,987
Buena Vista	1,133	194.552	9,893,513	1,982,910	253,929
Butler	1,307	172,994	10,001,012	1,934,175	271,108
Calhoun	1,058	168,387	9,787,333	1,639,187	222,284
Carroll	1,320	196,500	12,035,657	2,279,446	325,873
Cass	1,363	196,200	11,857,290	2,226,847	270,250
Cedar	1,470	223,418	12,768,048	3,057,341	310,799
Cerro Gordo	1,181	179,325	10,348,841	1,793,743	271,878
Cherokee	987	182,633	9,882,586	2,593,798	244,356
Chickasaw	1,470	202,925	9,645,365	2,083,385	476,602
Clarke	1,083	167,433	6,546,190	1,189,893	173,344
Clay	858	147,383	7,502,351	1,517,728	237,966
Clayton	2,573	358,848	10,482,530	4,202,879	478,471
Clinton	1,522	219,557	9,436,032	2,990,145	296,791
Crawford	1,480	280,346	13,602,031	2,554,472	400,257
Dallas	1,635	204,623	12,452,014	2,373,214	255,948
Davis	1,719	219,056	7,290,947	1,573,191	198,284
Decatur	1,491	215,491	6,908,375	1,518,199	242,208
Deleware	1,472	211,003	10,957,384	2,425,543	361,313
Des Moines	1,463	168,297	8,300,844	1,958,607	240,883
Dickinson	535	87,753	3,476,008	719,580	109,333
Dubuque	1,963	283,111	11,148,787	2,976,709	615,830
Emmet	545	97,009	4,715,588	844,053	149,933
Fayette	2,248	300,033	11,951,155	3,283,999	398,768
Floyd	1,149	155,394	8,627,835	1,812,055	302,119
Franklin	1,066	202,326	9,154,200	1,729,972	220,923
Fremont	1,194	181,862	9,575,964	1,680,301	157,479
Greene	1,119	185,394	10,011,550	1,816,478	240,441
Grundy	785	130,262	9,576,486	1,673,989	206,263
Guthrie	1,410	190,969	8,568,796	1,902,235	208,158
Hamilton	1,417	215,283	11,168,830	2,154,895	296,965

TABLE No. I—Continued.

County.	Farms Owned by Occupants.				
	Number.	Acres owned.	Land value, including acres rented	Value buildings.	Value farm implements.
Hancock	980	158,180	$ 8,737,240	$ 1,616,780	$ 227,996
Hardin	1,334	206,245	11,251,838	2,272,268	250,719
Harrison	1,852	229,549	9,751,529	1.947,289	253,856
Henry	1,387	162,302	8,510,462	2,943,352	237,430
Howard	1,237	180,525	7,084,270	1,841,531	290,390
Humboldt	856	143,331	8,882,469	1,716,810	245,335
Ida	792	137,313	7,802,632	1,707,340	263,237
Iowa	1,581	238,870	11,831,224	3,042,152	359,137
Jackson	1,846	309,519	9,494,157	2,941,920	351,583
Jasper	2,041	293,607	15,942,871	3,634,194	325,753
Jefferson	1,377	165,381	7,433,415	1,862,135	204.134
Johnson	1,960	269,928	12,234,819	3,519,999	353,360
Jones	1,484	226,573	11,371,104	4,292,119	310,374
Keokuk	2,005	246,554	12,204,288	2,724,089	278,273
Kossuth	1,538	277,949	13,407,722	2,389,984	370,127
Lee	1,731	211,278	8,558,685	2,747,553	306,032
Linn	2,339	258,217	12,721,018	3,398,150	401,392
Louisa	1,040	136,291	7,431,735	1,517,788	189,574
Lucas	1,291	178.534	7,626,933	1,118,925	202,125
Lyon	807	153,068	8.339,032	1,462,485	227,270
Madison	1,618	236,163	9,938,870	1,975,610	237,553
Mahaska	1,867	204,845	11,382,045	2,443,512	276,990
Marion	1,742	212,441	9,702,391	1,807,800	252,785
Marshall	1,417	169,406	10,594,894	1,424,090	287,526
Mills	1,099	147,123	9,054,762	1,883,675	215,933
Mitchell	1,264	193,067	9,575,543	1,989,300	291,398
Monona	1,200	217,270	8,045,659	1,464,378	208,425
Monroe	1,252	160,533	5,205,963	1,157,448	166,290
Montgomery	1,067	236,840	9,811,280	1,720,335	200,522
Muscatine	1,120	141,670	8,289,122	2,055,205	218,978
O'Brien	989	174,301	10,409,439	2,130,933	278,897
Osceola	565	105,322	6,025,158	1,005,525	152,535
Page	1,527	186,945	13,980,709	1,949,504	257,494
Palo Alto	909	150,179	7,095,717	1,270,710	192,650
Plymouth	1,326	253,131	15,255,141	3,869,111	527 015
Pocahontas	1,122	209,476	9,524,574	1,565,684	257,462
Polk	1,749	165,048	11,658,610	2,721,759	256,386
Pottawattamie	2,180	280,570	18,461,912	3,831,590	461,001
Poweshiek	1,482	214,117	13,172,245	2,675,941	298 929
Ringgold	1,508	254,121	8,678,828	1,653,695	224,467
Sac	1,100	194,839	11,714,644	2,131,437	291 619
Scott	1,340	143,844	8,246,410	2,842,075	236.226
Shelby	1 299	202,100	12,637,036	2,250,230	285,834
Sioux	1,281	217,698	13,207,208	3,332,559	414,325
Story	1,316	160,453	10,353,684	2,318,935	213 773
Tama	1,669	245,885	13,857,045	4,455,753	376,049
Taylor	1,592	202,260	9,958,553	2,066,878	279,424
Union	1.153	165,223	6,940,719	1,490,550	194,439
Van Buren	1,608	212,633	7,417,586	1,792,310	260,716
Wapello	1,484	161,815	6,386,144	1,549,211	174,560
Warren	1,815	216,020	10,236,142	2.105,573	221,351
Washington	1,715	213,773	13,400,876	3,040,755	351,849
Wayne	1,491	214,484	8,605,916	1,713,282	208,152
Webster	1,491	237,939	12,725,241	2,280,225	332,986
Winnebago	1,013	139,848	6,078,099	1,289,412	218,554
Winneshiek	2,293	312,893	11,840,486	3,448,488	489,960
Woodbury	1,552	252,088	12,497,068	2,273,688	362,110
Worth	1,079	163,405	6,276,569	2,784.579	222,710
Wright	973	182,018	9,137,162	1,499,050	251,230

GROUP I—Continued.

TABLE NO. 2.

County.	Acres land rented by owners.	Farms occupied by renters.				
		Number.	Acres rented.	Land value.	Value buildings.	Value farm implements.
Total for State	*2,044,197*	[illegible]	*11,301,448*	[illegible]	[illegible]	*$ 13,492,038*
Average			*159*			
Adair	23,864	851	130,216	5,859,781	$ 796,150	$ 115,828
Adams	17,596	518	90,799	4,105,230	555,310	82,625
Allamakee	14,358	282	45,192	2,203,169	323,902	54,780
Appanoose	18,735	411	49,337	1,471,868	295,981	45,189
Audubon	18,680	610	87,300	4,829,532	528,345	111,940
Benton	31,895	1,106	183,610	12,501,906	1,661,032	248,504
Black Hawk	20,930	682	123,640	7,140,729	1,232,231	205,136
Boone	39,221	1,103	148,791	8,245,892	1,722,695	174,288
Bremer	12,088	505	72,415	3,389,002	779,932	116,403
Buchanan	19,293	766	120,205	5,534,830	940,475	131,038
Buena Vista	16,641	770	142,422	7,289,317	980,904	157,708
Butler	20,850	902	151,096	6,738,013	1,131,290	192,641
Calhoun	33,840	817	147,995	7,551,946	931,374	149,560
Carroll	19,116	730	124,460	6,682,065	999,755	165,375
Cass	24,316	833	1,262,217	7,003,970	972,540	143,315
Cedar	23,976	764	111,882	6,932,311	1,332,162	163,383
Cerro Gordo	31,314	702	134,615	6,637,868	929,153	152,116
Cherokee	24,962	816	157,671	8,823,194	1,133,592	181,838
Chickasaw	18,549	464	68,261	2,961,243	574,000	89,384
Clarke	15,886	467	78,189	3,144,028	438,020	67,036
Clay	23,087	700	142,040	5,526,923	897,105	152,172
Clayton	20,289	550	85,941	3,229,349	792,135	107,809
Clinton	18,988	1,011	162,517	1,147,609	1,643,350	203,120
Crawford	23,663	881	146,663	7,392,935	1,053,180	192,263
Dallas	19,085	875	127,174	7,532,053	938,244	151,634
Davis	22,547	547	66,743	2,229,020	348,426	48,768
Decatur	18,411	534	84,248	2,687,323	525,639	58,040
Delaware	15,968	710	146,774	5,561,537	1,132,305	167,595
Des Moines	12,453	501	60,101	3,109,190	544,983	101,872
Dickinson	12,255	566	109,782	4,276,400	610,475	92,249
Dubuque	10,384	374	55,004	2,142,039	589,470	158,785
Emmet	20,629	454	98,497	4,107,115	505,144	84,012
Fayette	28,520	824	124,813	5,283,278	1,060,365	134,742
Floyd	23,671	733	119,941	6,286,464	1,072,686	171,662
Franklin	12,197	798	155,900	7,646,359	1,087,138	156,349
Fremont	14,194	667	93,022	4,873,942	580,885	70,997
Greene	16,762	849	144,210	7,632,739	1,031,096	168,006
Grundy	13,613	882	164,556	10,778,490	1,341,700	202,732
Guthrie	20,750	793	119,907	5,495,543	786,997	123,719
Hamilton	14,323	854	138,619	7,625,941	1,123,885	179,580
Hancock	24,229	677	160,519	6,912,118	827,728	146,686
Hardin	20,898	759	117,180	6,982,795	929,961	139,603
Harrison	25,566	1,019	144,889	5,703,556	807,247	138,404
Henry	16,216	576	73,478	4,461,041	763,615	127,919
Howard	14,427	434	85,985	3,889,619	651,328	95,818
Humboldt	22,244	521	99,758	4,039,508	655,793	136,102
Ida	10,812	614	112,692	6,000,660	1,080,410	190,917
Iowa	18,208	533	81,626	4,472,194	766,210	114,070
Jackson	9,998	384	59,189	2,147,837	583,245	65,592
Jasper	14,936	998	137,257	7,589,130	1,188,250	146,728

TABLE NO. 2—CONTINUED.

County	Acres land rented by owners.	Farms Occupied by Renters.				
		Number.	Acres rented.	Land value.	Value buildings.	Value farm implements.
Jefferson	17,274	591	65,149	3,004,517	$ 587,846	$ 83,203
Johnson	16,417	645	91,126	5,397,628	334,350	105,764
Jones	11,566	566	82,367	4,316,730	578,365	118,547
Keokuk	30,598	758	99,813	4,563,650	676,500	83,061
Kossuth	36,242	1,163	247,124	10,158,458	1,317,020	224,867
Lee	16,563	578	67,222	2,676,196	635,500	91,306
Linn	24,603	869	126,348	6,907,172	1,332,769	176,976
Louisa	22,542	477	63,281	3,184,106	516,738	80,217
Lucas	19,115	456	60,584	2,399,149	257,885	55,470
Lyon	24,646	737	155,504	7,586,022	808,544	166,176
Madison	14,148	710	87,788	4,026,149	631,140	89,296
Mahaska	26,808	639	109,228	5,418,622	890,868	122,312
Marion	14,947	642	98,823	4,756,487	759,336	106,467
Marshall	27,479	697	156,766	8,702,105	1,240,880	193,296
Mills	21,500	442	84,798	4,227,317	565,307	97,755
Mitchell	26,819	448	92,241	4,366,545	618,575	104,224
Monona	18,291	656	144,161	5,582,204	729,386	122,348
Monroe	11,632	464	58,711	1,572,284	321,628	57,960
Montgomery	12,258	718	168,725	7,042,135	917,945	138,327
Muscatine	15,972	471	53,847	4,067,592	894,650	136,866
O'Brien	21,087	736	137,148	7,329,453	886,860	167,491
Osceola	14,496	474	106,284	4,711,480	567,520	88,003
Page	15,909	820	109,888	6,369,563	828,413	112,856
Palo Alto	25,481	648	146,480	6,691,829	750,849	128,446
Plymouth	29,825	1,117	216,733	12,012,636	1,545,408	260,884
Pocahontas	32,444	672	125,409	5,878,534	628,280	128,967
Polk	28,335	1,212	134,600	8,171,660	1,090,060	166,941
Pottawattamie	42,922	1,479	228,450	12,806,361	1,668,352	274,865
Poweshiek	20,571	706	115,464	6,494,323	1,046,558	134,732
Ringgold	16,325	505	78,369	2,515,769	410,146	61,738
Sac	14,882	737	143,900	7,844,063	1,071,009	208,575
Scott	12,663	678	123,671	7,589,263	1,647,530	191,326
Shelby	15,406	832	133,258	8,073,241	862,610	160,391
Sioux	41,743	1,092	196,967	9,525,516	1,060,617	249,842
Story	20,707	909	156,513	8,604,709	1,258,775	169,218
Tama	29,232	912	158,350	9,618,346	1,340,960	206,314
Taylor	18,148	671	91,327	3,390,146	619,548	94,113
Union	15,487	473	73,258	3,066,424	478,721	76,491
Van Buren	21,453	529	73,426	2,510,454	454,355	114,506
Wapello	16,236	557	64,174	2,917,221	449,154	53,461
Warren	17,473	706	88,122	3,844,465	618,650	79,968
Washington	26,479	685	94,221	5,633,211	918,626	135,668
Wayne	14,474	450	77,236	4,232,703	429,465	66,562
Webster	29,758	915	154,744	8,580,313	866,570	155,406
Winnebago	14,542	424	73,719	2,725,563	366,541	73,325
Winneshiek	18,244	516	90,868	3,210,729	653,351	107,254
Woodbury	26,361	1,068	176,847	8,337,817	1,051,025	196,306
Worth	15,640	465	62,526	2,708,522	449,906	86,128
Wright	23,061	719	146,753	6,666,709	1,043,366	164,386

GROUP I—CONTINUED.

TABLE NO. 3.

County.	Grand Total.					
	Number of farms.	Number of acres.	Land value.	Value of buildings.	Value farm implements.	Total value.
Total of State	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average		[illegible]				
Adair	2,245	350,271	$ [illegible]	$ [illegible]	$ [illegible]	$ 15,552,482
Adams	[illegible]	271,970	11,524,895	[illegible]	[illegible]	13,838,436
Allamakee	2,141	371,985	[illegible]	2,786,508	459,907	12,060,684
Appanoose	2,059	280,649	8,218,403	1,681,112	405,049	10,304,564
Audubon	[illegible]	284,580	15,745,805	[illegible]	374,961	18,354,453
Benton	[illegible]	421,300	28,554,686	4,763,352	592,967	33,711,005
Black Hawk	1,996	324,669	18,920,090	3,865,673	[illegible]	23,347,773
Boone	2,510	361,309	18,319,748	3,808,361	438,592	22,566,701
Bremer	[illegible]	273,000	11,656,940	3,394,548	494,703	15,546,191
Buchanan	2,263	336,735	15,512,995	3,008,989	372,020	18,894,004
Buena Vista	[illegible]	353,615	17,182,830	2,963,814	411,537	[illegible]
Butler	2,209	[illegible]	16,739,025	3,065,495	463,749	20,268,239
Calhoun	1,875	350,222	17,342,279	2,570,561	371,844	20,284,684
Carroll	2,050	340,076	18,717,722	3,279,201	491,248	22,488,171
Cass	2,196	[illegible]	18,861,260	3,199,387	[illegible]	22,474,212
Cedar	2,234	359,273	19,700,359	4,389,508	[illegible]	24,564,044
Cerro Gordo	1,883	345,254	16,986,710	[illegible]	423,994	[illegible]
Cherokee	1,803	[illegible]	18,705,780	[illegible]	426,194	22,859,364
Chickasaw	1,934	289,735	12,606,608	2,657,385	565,986	15,829,979
Clarke	1,550	[illegible]	9,690,218	1,627,913	240,380	11,558,511
Clay	1,558	[illegible]	13,029,274	2,414,833	390,138	15,834,245
Clayton	3,123	465,078	13,711,879	4,995,014	[illegible]	19,293,173
Clinton	2,533	[illegible]	17,583,641	4,633,495	[illegible]	22,717,047
Crawford	2,361	450,672	20,994,966	3,607,652	592,520	25,195,138
Dallas	2,510	350,882	[illegible]	3,311,458	407,582	23,703,107
Davis	[illegible]	308,346	9,519,967	1,921,617	247,052	11,688,636
Decatur	2,025	318,150	9,595,698	2,044,138	300,248	11,940,084
Delaware	2,182	[illegible]	16,518,921	3,557,848	[illegible]	20,605,677
Des Moines	1,964	240,851	11,410,034	2,503,590	342,755	14,256,379
Dickinson	1,101	[illegible]	7,752,408	1,330,055	201,582	9,284,045
Dubuque	[illegible]	348,499	13,290,826	3,566,179	774,615	17,631,620
Emmet	[illegible]	216,135	8,822,703	1,349,197	233,945	[illegible]
Fayette	3,072	453,366	17,234,433	4,344,364	533,510	22,112,307
Floyd	[illegible]	299,006	[illegible]	2,884,741	473,781	18,272,821
Franklin	[illegible]	370,423	16,800,559	2,817,110	377,272	19,994,941
Fremont	1,861	[illegible]	[illegible]	2,261,186	228,476	16,939,568
Greene	1,968	[illegible]	[illegible]	2,547,574	408,447	20,900,310
Grundy	1,667	[illegible]	20,354,976	3,015,689	408,995	23,779,660
Guthrie	[illegible]	331,626	14,064,339	2,689,282	331,877	17,085,448
Hamilton	2,271	368,225	18,794,771	3,278,780	476,545	22,550,096
Hancock	1,657	[illegible]	15,649,358	2,444,508	374,682	18,468,548
Hardin	2,093	[illegible]	18,234,633	3,202,229	390,322	21,827,184
Harrison	2,871	[illegible]	15,455,085	2,754,536	392,260	18,601,881
Henry	1,963	251,996	12,971,503	[illegible]	365,349	17,043,819
Howard	1,671	283,937	[illegible]	2,492,859	386,208	13,852,956
Humboldt	1,377	265,333	12,361,977	2,372,603	381,437	15,616,017
Ida	[illegible]	[illegible]	13,803,292	2,787,750	454,154	17,045,196
Iowa	2,114	[illegible]	[illegible]	3,508,362	[illegible]	20,584,987
Jackson	[illegible]	[illegible]	[illegible]	[illegible]	417,175	15,584,334
Jasper	3,034	[illegible]	[illegible]	4,822,444	472,481	28,826,326

TABLE NO. 3—CONTINUED.

County.	Grand Total.					
	Number of farms.	Number of acres.	Land value.	Value buildings	Value farm implements	Total value
Jefferson	1,908	247,804	$10,437,932	$ 2,450,081	$ 287,337	$ 13,175,350
Johnson	2,605	377,471	16,232,457	4,454,349	459,154	21,145,960
Jones	2,087	332,096	16,286,834	5,264,484	427,921	21,980,239
Keokuk	2,764	365,965	16,767,981	3,400,589	371,354	20,539,924
Kossuth	2,701	575,425	23,594,380	3,707,004	594,934	27,896,318
Lee	2,304	297,005	11,234,881	3,383,053	397,240	15,015,174
Linn	3,322	405,904	19,328,090	4,730,919	578,368	24,637,377
Louisa	1,510	224,115	10,615,843	2,034,571	269,791	12,920,205
Lucas	1,741	258,233	10,026,082	1,376,810	257,595	11,660,487
Lyon	1,534	337,321	15,934,044	2,401,029	893,446	18,728,519
Madison	2,228	338,101	14,263,919	2,605,850	326,849	17,196,618
Mahaska	2,806	340,821	16,800,667	3,334,380	399,202	20,534,249
Marion	2,585	331,211	14,458,878	2,597,196	359,692	17,415,766
Marshall	2,414	353,651	19,296,999	3,664,920	480,792	23,442,711
Mills	1,741	255,409	13,882,079	2,388,982	313,688	16,584,749
Mitchell	1,710	302,121	13,842,088	2,607,975	395,622	16,845,585
Monona	2,058	379,692	13,627,863	2,193,764	330,773	16,152,400
Monroe	1,716	230,875	7,078,247	1,490 087	224,270	8,792,604
Montgomery	1,782	357,137	16,853,415	2,638,280	339,449	19,831,144
Muscatine	1,792	241,496	13,257,014	2,954,855	355,944	16,567,813
O'Brien	1,695	332,558	17,738,892	3,117,793	446,388	21,303,073
Osceola	1,039	228,711	10,736,638	1,573,045	251,538	12,561,221
Page	2,347	311,734	20,947,212	2,775,917	375,550	24,098,679
Palo Alto	1,557	312,040	12,787,546	1,921,559	321,096	15,030,201
Plymouth	2,443	499,689	27,267,777	5,214,519	987,849	33,470,145
Pocahontas	1,794	358,229	15,403,108	2,204,914	384,329	17,992,351
Polk	2,961	328,643	21,030,260	3,811,809	423,327	25,265,396
Pottawattamie	3,659	546,643	31,268,273	5,499,942	735,036	37,503,251
Poweshiek	2,182	350,172	19,667,164	3,719,524	433,721	23,820,409
Ringgold	2,013	340,017	11,194,497	2,053,835	286,203	13,534,635
Sac	1,887	353,722	19,558,707	3,202,446	495.194	23,256,347
Scott	2,318	279,568	15,835,673	4,489,605	427,752	20,753,030
Shelby	2,132	353,468	20,710,277	3,232,840	446,225	24,389,342
Sioux	2,373	445,339	23,033,024	4,393,176	664,167	28,090,367
Story	2,315	337,673	19,958,393	3,577,710	382,991	23,919,094
Tama	2,581	433,467	23,475,391	5,796,613	579,963	29,851,967
Taylor	2,263	313,336	13,948,699	2,685,821	373,543	17,008,063
Union	1,626	254,468	10,007,143	1,964,341	271,330	12,242,814
Van Buren	2,131	307,512	9,928,040	2,276,665	375,221	12,579,926
Wapello	2,041	242,747	9,303,365	1,998,395	228,021	11,529,781
Warren	2,521	321,617	14,179,637	2,724,223	301,319	17,205,179
Washington	2,370	328,473	19,030,087	3,959,380	487,517	23,480,984
Wayne	1,981	289,688	12,888,619	2,142,687	274,714	15,306,020
Webster	2,406	422,469	21,695,554	3,147,095	518,392	25,271,041
Winnebago	1,437	233,409	8,803,682	1,678,253	291,889	10,773,824
Winneshiek	2 809	412 715	15,051,215	4,101,839	597,215	19,750,269
Woodbury	2,650	455,836	20,834,865	3,324,713	558,423	24,718,001
Worth	1,444	242,071	8,985,391	3,234,379	308,836	12,528,606
Wright	1,683	351 772	15.796,171	2,548,416	415,624	18,760,211

GROUP II.

TABLE NO. I.

Acres, Bushels and Value of Corn, Wheat, Oats, Barley, Rye and Buckwheat, by Counties.

Counties.	CORN.			WHEAT.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Total for State...	*9,542,956*	*346,577,988*	*$117,658,097*	*517,274*	*5,559,747*	*$ 4,757,047*
Adair	99,177	3,685,215	$ 1,174,195	4,224	35,253	$ 24,781
Adams	75,209	2,565,684	982,356	2,027	15,746	9,571
Allamakee	46,996	1,760,078	613,261	2,054	19,051	14,447
Appanoose	53,399	1,619,120	623,196	722	7,461	5,045
Audubon	91,969	3,797,856	1,203,141	11,714	94,260	67,037
Benton	132,722	4,965,549	1,694,749	786	8,879	7,387
Black Hawk	104,948	3,400,036	1,115,651	554	14,240	5,355
Boone	115,838	4,617,370	1,414,434	1,949	27,780	18,354
Bremer	61,822	2,305,580	697,380	324	4,609	3,344
Buchanan	92,753	2,857,105	1,021,521	124	1,438	1,211
Buena Vista	106,665	3,462,731	1,050,968	1,696	23,812	15,378
Butler	112,226	3,749,515	1,145,679	381	7,332	5,609
Calhoun	111,813	4,150,962	1,238,626	2,011	40,962	18,095
Carroll	118,275	4,729,866	1,459,603	9,553	112,917	93,723
Cass	118,206	4,700,914	1,516,381	10,646	95,544	75,756
Cedar	109,214	4,696,357	1,746,621	1,240	18,003	12,502
Cerro Gordo	97,123	2,743,166	867,420	797	15,589	6,922
Cherokee	119,023	4,458,241	1,406,310	6,845	71,572	51,663
Chickasaw	65,688	2,126,602	623,924	686	10,163	6,624
Clarke	54,333	1,657,177	687,254	150	1,634	1,272
Clay	88,937	2,621,191	766,288	1,336	15,963	13,755
Clayton	77,535	3,042,827	1,155,431	3,689	30,714	19,5[illegible]
Clinton	124,132	4,607,705	1,980,396	1,741	21,172	17,773
Crawford	143,661	5,392,923	1,784,177	25,398	311,396	276,766
Dallas	124,021	5,449,920	1,920,682	2,599	27,588	20,051
Davis	60,347	1,988,970	769,488	655	5,702	5,119
Decatur	66,678	1,889,126	908,567	437	5,608	4,066
Delaware	90,179	3,128,354	1,215,623	751	11,986	5,997
Des Moines	65,020	2,790,884	1,025,040	2,186	33,414	25,424
Dickinson	49,534	1,138,093	318,472	2,139	23,453	18,138
Dubuque	72,044	2,809,120	1,100,938	1,781	22,395	18,026
Emmet	53,538	1,223,460	373,587	827	11,750	8,383
Fayette	93,132	3,225,338	1,052,100	1,636	18,197	11,536
Floyd	92,456	2,913,545	898,458	181	3,277	2,209
Franklin	109,670	3,242,563	1,013,334	1,449	24,815	14,877
Fremont	121,387	4,457,151	1,616,308	5,643	44,519	27,810
Greene	117,984	4,774,445	1,444,391	851	10,170	7,448
Grundy	104,090	3,894,182	1,273,145	1,036	14,739	9,983
Guthrie	95,392	3,747,789	1,144,826	6,678	67,778	48,753
Hamilton	115,170	4,220,213	1,404,69[illegible]	2,476	37,316	31,812

TABLE NO. I—CONTINUED.

County.	CORN.			WHEAT.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Hancock	89,315	2,223,490	$ 672,249	2,121	31,118	$ 21,778
Hardin	112,260	3,978,323	1,251,741	2,695	38,308	33,722
Harrison	148,961	5,265,626	1,694,927	25,187	235,394	226,114
Henry	71,312	3,296,584	1,208,206	931	11,422	11,571
Howard	52,280	1,435,953	437,484	805	11,232	5,188
Humboldt	75,761	2,869,313	872,163	3,629	55,059	45,875
Ida	98,827	3,844,056	1,267,937	8,759	101,577	79,672
Iowa	94,038	3,901,014	1,377,890	1,347	18,970	13,637
Jackson	73,148	3,072,295	1,188,093	2,122	23,233	17,409
Jasper	143,789	5,587,482	2,047,656	5,042	64,863	37,988
Jefferson	64,156	2,628,333	912,075	1,562	20,292	16,984
Johnson	105,071	4,404,527	1,517,527	865	11,296	8,240
Jones	86,534	3,516,690	1,422,885	662	7,038	5,892
Keokuk	103,005	4,235,393	1,436,578	1,368	14,632	12,461
Kossuth	147,075	3,787,673	1,164,985	4,706	67,387	58,078
Lee	65,625	2,447,672	946,064	14,034	77,908	70,306
Linn	117,360	4,323,869	1,824,049	4,559	24,153	15,850
Louisa	73,004	2,982,596	1,042 932	1,513	20,630	18,147
Lucas	56,396	1,747,597	702,283	3,020	56,544	17,726
Lyon	98,182	3,037,697	901,625	20,407	233,547	197,780
Madison	88,495	3,837,875	1,310,840	2,091	15,418	9,299
Mahaska	109,277	4,545,027	1,504,239	2,126	26,599	19,819
Marion	100,699	3,981,632	1,553,614	3,191	36,636	25,456
Marshall	120,552	5,090,833	1,679,553	3,491	49,930	37,769
Mills	98,393	3,778,468	1,086,117	6,884	50,364	36,702
Mitchell	61,006	1,980,103	555,540	1,007	10,879	8,300
Monona	136,859	4,520,684	1,420,669	19,374	218,209	199,111
Monroe	43,658	1,409,440	532,336	879	9,101	8,136
Montgomery	99,417	3,658,256	1,253,298	14,005	104,297	81,922
Muscatine	76,215	2,970,907	1,089,471	1,271	13,293	11,482
O'Brien	103,770	2,966,390	856,640	6,333	86,255	67,960
Osceola	56,980	1,313,288	376,085	4,761	65,809	53,322
Page	118,222	4,024,645	1,619,493	10,229	90,685	66,641
Palo Alto	82,557	2,185,245	625,543	1,178	19,996	12,181
Plymouth	174,124	6,857,629	2,089,839	51,754	682,244	645,857
Pocahontas	92,214	3,071,561	869,588	1,185	18,124	14,674
Polk	118,657	4,875,838	1,736,655	3,931	57,061	38,560
Pottawattamie	218,508	8,680,668	2,836,641	26,917	217,465	192,357
Poweshiek	107,510	4,288,208	1,537,929	1,580	18,800	13,314
Ringgold	74,950	1,772,128	752,762	421	2,605	1,814
Sac	121,083	4,692,590	1,438,211	2,817	42,813	30,530
Scott	80,840	3,626,799	1,281,670	3,071	36,528	34,064
Shelby	126,471	5,300,890	1,651,506	22,534	226,519	184,009
Sioux	151,232	5,153,447	1,551,239	42,313	567,397	473,835
Story	124,761	5,188,247	1,689,785	1,391	25,073	12,801
Tama	124,812	5,003,713	1,682,275	4,346	46,096	32,149
Taylor	88,095	2,257,960	942,942	1,588	12,998	8,035
Union	63,737	1,873,305	760,075	174	1,387	1,190
Van Buren	52,907	1,945,441	752,938	1,566	17,272	13,810
Wapello	62,748	2,370,788	827,326	987	14,970	10,167
Warren	93,277	3,622,435	1,309,732	1,807	18,194	12,149
Washington	101,873	4,530,905	1,557,726	1,348	11,700	10,108
Wayne	70,223	2,072,550	827,987	131	2,059	708
Webster	114,661	4,270,496	1,396,066	3,321	51,072	41,631
Winnebago	55,544	1,428,210	424,973	5,288	78,488	69,284
Winneshiek	75,238	2,803,434	873,740	3,720	47,461	35,886
Woodbury	181,190	6,804,707	2,680,594	25,744	296,422	265,016
Worth	45,378	1,294,744	397,623	2,392	40,626	26,845
Wright	99,627	3,335,296	1,019,872	2,822	44,752	35,175

GROUP II—CONTINUED.

TABLE NO. II.

Counties.	OATS.			BARLEY.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Total for State ..	*4,315,637*	*134,150 609*	*$ 34,225,399*	*424.550*	*15,769,505*	*$ 5,334.832*
Adair	32,837	772,429	$ 179,992	2,908	40,725	$ 12,802
Adams	16,525	365,674	105,299	2,361	55,845	16,173
Allamakee	41,142	1,266,299	329,617	11,564	342,655	130,117
Appanoose	11,087	247,142	75,587	105	2,133	755
Audubon	31,575	857,125	180,583	7,256	194,806	57,349
Benton	68,256	2,135,229	577,122	14,665	447,269	125,227
Black Hawk	53,126	1,560,734	400,986	3,039	79,934	29,785
Boone	51,206	1,561,676	360,800	291	5,863	2,016
Bremer	54,796	1,736,425	423,845	2,789	83,067	29,095
Buchanan	51,086	1,582,436	394,802	1,856	50,457	19,169
Buena Vista	67,873	2,349,125	563,641	3,104	76,843	23,611
Butler	77,351	2,274,792	577,090	1,194	29,291	9,680
Calhoun	64,538	2 221,269	544,611	3,869	94,534	28,509
Carroll	60,342	1,890,873	460,559	6,555	154.889	46,338
Cass	32,749	811,799	198,963	3,577	78,865	23,156
Cedar	32,003	1,079,786	290,982	18,455	431,134	178,859
Cerro Gordo	77,787	2,394,031	615,058	2,648	60,935	25,432
Cherokee	59,753	2,448,683	584,325	6,415	185,586	54,313
Chickasaw	66,633	2,175,040	492,573	4,231	124,921	41,712
Clarke	15,204	306,968	85,862	154	2,591	953
Clay	60,232	1,939,928	476,039	7,852	176,624	52,445
Clayton	62,732	2,044,299	539,566	13,301	402,187	146,776
Clinton	40,257	1,188,814	340,542	9,530	216,050	92,469
Crawford	50,372	1,627,044	391,181	6,980	195,216	58,327
Dallas	40,307	1,335,410	321,390	707	20,713	5,646
Davis	16,567	455,562	121,658	156	2,666	1,132
Decatur	14,572	278,474	92,250	24	341	167
Delaware	41,310	1,411,476	388,580	8,785	277,027	102,692
Des Moines	27,226	881,642	256,367	666	18,691	8,291
Dickinson	37,412	1,110,327	257,811	13,750	296,029	91,037
Dubuque	49,842	1,612,119	480,778	5,717	158,000	65,553
Emmet	44,698	1,409,065	337,944	1,858	43,080	12,716
Fayette	65.775	2,043,118	511,083	9,831	271,708	113,397
Floyd	74.769	2,552,765	638,219	4,636	129,031	49,199
Franklin	77,610	2,278,359	546,903	1,123	29,853	8,713
Fremont	11,193	202,837	58,623	231	5,122	1,985
Greene	49,510	1,452,301	360,052	2,002	49 528	15,437
Grundy	68,457	2,088,685	526,537	7,074	195,768	62,696
Guthrie	41,005	1,085,239	287,273	2,431	57,049	17,287
Hamilton	59,622	1,674,775	462,704	766	19,432	6,543
Hancock	85,129	2,354,776	567,027	2,054	46,511	14,122
Hardin	62,060	1,680,183	415,305	1,109	29 007	9,449
Harrison	19,108	546,529	131,298	1,644	42,379	13,886
Henry	30,105	989,292	266,401	972	22,381	9,310
Howard	56,988	1,807,650	435,182	9,364	253,349	82,862
Humboldt	49,074	1,725 071	420,504	1,343	36,619	11,193
Ida	37,110	1,384,822	356,073	7,585	215,863	67,481
Iowa	38,384	1,183,704	311,286	4,101	100,995	37,024
Jackson	28,629	704,309	215,512	6,107	133,185	54,594
Jasper	47,005	1,287,410	392,486	2,507	57,854	17,760

TABLE NO. II.—CONTINUED.

Counties.	OATS.			BARLEY.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Jefferson	24,048	757,396	$ 271,338	1,686	37,986	$ 14,024
Johnson	41,994	1,362,071	373,462	7,343	202,082	76,242
Jones	27,486	896,573	274,109	7,684	218,713	86,146
Keokuk	32,761	933,835	235,388	5,782	125,563	40,7[illegible]0
Kossuth	122,281	3,810,700	902,166	3,027	68,135	23,588
Lee	21,440	655,625	196,138	124	2,242	1,010
Linn	51,311	1,693,052	514,423	963	27,857	11,415
Louisa	23,215	729,645	215,972	712	18,559	7,429
Lucas	12,960	260,560	78,417	57	983	448
Lyon	58,175	2,325,642	557,871	56,230	1,586,298	420,278
Madison	20,828	464,235	123,994	2,903	70,943	21,298
Mahaska	30,489	864,419	228,722	5,944	135,323	43,440
Marion	27,219	582,031	163,067	1,672	36,696	13,534
Marshall	58,558	2,096,573	525,881	2 424	55,927	22,144
Mills	14,578	310,225	82,208	977	21,040	7,523
Mitchell	75,970	2,818,144	697,242	11,718	340,545	105,646
Monona	19,487	525,359	130,237	6,422	128,303	40,508
Monroe	9,516	235,302	69,646	362	5,736	2.570
Montgomery	14,588	334,529	97,561	2,750	20,479	7,984
Muscatine	18,707	563,125	164,539	9,779	228,883	89.373
O'Brien	60,966	2,345,458	587,519	25,511	654,058	186,311
Osceola	47,966	1,578,955	330,796	21,383	573,558	164,955
Page	17,746	335,423	102,527	1,004	20,433	8,359
Palo Alto	61,955	1,979,540	504,006	2,448	57,092	17,345
Plymouth	66,386	2,533,907	606,942	19,975	556,934	322,114
Pocahontas	69,246	2,444,460	585,479	1,525	30,246	9,077
Polk	40,327	1,254,774	357,065	243	6,661	3 567
Pottawattamie	42,122	1,022,506	313,815	2,480	60,901	19,674
Poweshiek	37,609	1,034,321	271,876	6,772	163,338	53,377
Ringgold	21,368	360,378	109,423	19	323	161
Sac	51,405	1,834,687	426,770	10,282	291,518	90,330
Scott	21,114	595,023	194,495	34,764	835,595	349,588
Shelby	31,679	928,508	221,048	8,206	229,838	68,495
Sioux	64,335	2,602,980	573,347	41,433	1,198,335	347,878
Story	55,593	1,741,751	539,404	607	15,395	6,992
Tama	57,070	1,718,573	417,857	17,048	462,718	146,920
Taylor	17,671	301,506	91,010	1 890	36,467	11,069
Union	18,722	337,366	92,664	234	3,467	1,592
Van Buren	19,295	590,682	175,061	75	1,300	609
Wapello	16,385	487,247	134,790	1,841	38,704	14,034
Warren	22,896	477,559	128,288	1,109	21,021	8,540
Washington	39,359	1,230,218	338,839	3,192	78,080	28,759
Wayne	17,023	311,197	92,232	17	147	53
Webster	74 575	2,461,488	600,254	1,005	25,307	7,869
Winnebago	46,876	1,406,275	342,832	1,486	37,698	11,064
Winneshiek	72,607	2,409,154	603,404	17,151	500,583	177,621
Woodbury	42,108	1,406,972	360,292	12,922	330,946	107,675
Worth	63,556	1,852,117	461,395	5,316	116,355	35,905
Wright	103,761	1,987,009	510,514	1,841	45,593	14,229

GROUP II—CONTINUED.

TABLE NO. III.

County.	RYE.			BUCKWHEAT.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Total for State...	*66,065*	*924,950*	*$ 480,088*	*10 590*	*118,045*	*$ 84,279*
Adair	70	792	$ 465	49	689	$ 549
Adams	140	1,885	995	22	180	152
Allamakee	1,557	23,552	13,893	128	1.237	1,092
Appanoose	....	5,091	2,830	37	312	221
Audubon	125	2,006	1,181	2	37	26
Benton	458	6,636	4,231	70	794	879
Black Hawk	1,285	16,070	9,131	70	914	798
Boone	226	3,928	2,542	....	523	344
Bremer	1,061	14,581	7,729	115	1,581	935
Buchanan	780	11,351	6,271	347	4,815	3,428
Buena Vista	56	1,257	394	68	705	487
Butler	972	12,604	6,207	131	1,795	1,646
Calhoun	139	1,823	879	98	1,160	816
Carroll	87	1,260	830	45	580	303
Cass	164	2,352	1,321	3	21	24
Cedar	619	7,416	4,095	71	1,200	985
Cerro Gordo	185	2,472	1,560	462	4.785	2,993
Cherokee	45	670	429	30	412	374
Chickasaw	526	9,116	4,274	629	9,021	4,582
Clarke	128	2,021	1,152	50	584	406
Clay	99	1,761	874	159	1,951	1,110
Clayton	4,117	76,930	36,427	209	2,800	2,833
Clinton	1,918	29,205	16,383	32	271	242
Crawford	205	2,762	1,462	12	212	84
Dallas	602	10,186	5,780	4	36	29
Davis	1,562	15,066	7,173	47	5,18	349
Decatur	257	3,059	1,652	21	167	161
Delaware	1,653	24,162	13,288	180	2,425	2,168
Des Moines	1,819	24,381	13,078	25	246	284
Dickinson	60	8,50	440	321	2,351	1,355
Dubuque	996	17,536	9,436	17	251	212
Emmet	64	1,008	647	74	802	567
Fayette	683	14,614	6,418	538	6,548	5,275
Floyd	1,135	11,602	6,605	392	4,343	2,711
Franklin	111	1,904	947	139	1,520	926
Fremont	336	4,840	2,636	4	75	55
Greene	53	985	579	32	835	302
Grundy	75	1,387	686	51	877	696
Guthrie	102	1,785	904	10	140	90
Hamilton	25	530	148	115	863	843
Hancock	56	1,121	483	211	2,401	1,220
Hardin	130	2,017	1,085	211	2,278	1,597
Harrison	205	2,826	1,512	20	361	242
Henry	2,620	31,807	18,564	35	204	168
Howard	40	635	288	992	9,776	7,767
Humboldt	8	120	68	63	721	468
Ida	107	1,805	1,040	5	80	70
Iowa	596	8,075	5,003	87	1,167	1,011
Jackson	1,409	18,851	9,505	151	1,800	1,493
Jasper	211	3,289	1.755	153	395	337

TABLE NO. III—CONTINUED.

County.	RYE.			BUCKWHEAT.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Jefferson	3,636	41,780	$ 22,711	76	622	$ 432
Johnson	1,616	23,091	13,051	20	258	206
Jones	872	11,170	6,342	116	1,337	1,355
Keokuk	1,848	25,420	13,857	47	658	558
Kossuth	101	1,240	665	262	2,189	1,233
Lee	4,167	50,959	28,772	117	1,164	891
Linn	932	13,628	7,885	249	2,841	2,976
Louisa	2,892	34,306	17,802	73	990	717
Lucas	401	3,515	1,849	50	406	363
Lyon	155	3,639	1,297	57	440	327
Madison	203	2,607	1,307	30	307	487
Mahaska	1,025	16,154	7,955	40	363	268
Marion	354	4,409	2,004	17	181	111
Marshall	288	5,384	3,019	28	324	387
Mills	42	555	212	1	10	7
Mitchell	200	2,997	1,667	609	6,398	3,124
Monona	257	3,326	1,749	47	380	287
Monroe	871	8,380	4,793	43	537	333
Montgomery	89	1,446	697	1	24	12
Muscatine	3,196	32,179	18,219	46	671	542
O'Brien	56	1,207	613	42	489	193
Osceola	93	1,935	680	130	1,550	866
Page	352	4,733	2,540	....	12	12
Palo Alto	39	593	283	68	576	293
Plymouth	185	3,360	1,812	13	227	298
Pocahontas	79	1,050	558	110	1,069	648
Polk	403	6,224	3,485	12	75	64
Pottawattamie	223	2,672	2,078	19	187	134
Poweshiek	222	3,046	1,622	18	166	150
Ringgold	160	1,282	832	121	925	952
Sac	70	1,172	510	39	604	380
Scott	1,154	14,651	9,332	3	35	24
Shelby	190	36,277	2,230	4	19	24
Sioux	44	756	400	39	585	307
Story	290	5,594	3,374	89	1,929	1,382
Tama	257	4,175	2,580	21	307	228
Taylor	363	3,794	2,055	41	391	360
Union	94	1,127	676	68	605	539
Van Buren	3,275	30,624	17,050	96	905	632
Wapello	2,097	25,709	12,493	30	345	227
Warren	307	3,428	1,805	44	598	389
Washington	1,563	22,100	11,263	63	226	157
Wayne	140	1,248	635	72	518	422
Webster	185	2,900	1,410	49	651	439
Winnebago	50	1,115	340	84	645	359
Winneshiek	272	3,525	2,209	166	2,432	1,812
Woodbury	675	8,870	4,189	18	209	187
Worth	42	672	298	312	2 690	1,671
Wright	160	4,947	1,608	153	1,716	1,129

GROUP II—CONTINUED.

TABLE NO. IV.

Acres, Tons and Value of Clover, Timothy, Millet and Hungarian, Alfalfa, Wild Hay and Other Forage Crops, and Value of Other Farm Crops, by Counties.

County.	Clover.			Timothy.			Millet and Hungarian.			Alfalfa.			Wild Hay.			Other forage crops—value.	Other farm crops—value.
	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.		
Total—State.	*207,171*	*315,921*	*$1,319,692*	*3,314,149*	*4,594,860*	*$21,617,150*	*66,821*	*119,281*	*$416,601*	*10,351*	*25,724*	*$107,144*	*996,122*	*1,313,518*	*$4,280,151*	*$771,128*	*$192,134*
Adair.......	3,985	5,383	$ 17,210	41,313	62,019	$ 235,434	274	474	$ 1,663	......	.. .	....	5,256	8,819	$ 26,002	$ 6,188	$ 215
Adams......	1,941	2,922	12,253	33,174	51,398	211,430	305	459	1,764	26	50	$ 191	2,142	3,689	11,118	1,158	1,403
Allamakee.	1,592	2,607	11,857	43,170	58,530	307,898	188	268	1,334	1	2	25	1 694	2,983	13,754	3,527	2,740
Appanoose.	472	483	2,403	55,913	60,656	280,624	3,487	4,201	17,556	....	......	...	1,010	1,651	5,066	1,870	1,254
Audubon..	4,421	6,539	27,589	25,554	42,545	172,638	363	812	2,690	1	2	8	4,287	8,091	32,455	1,770	1,621
Benton.	2,179	2.888	15,710	46,465	62,035	369,776	210	381	1,873	2	3	18	9,058	12 462	54,584	24,384	7,764
BlackHawk	1,831	2,764	13,796	34,363	51,577	248,482	530	1,158	3,876	69	85	255	12,508	19,222	71,434	32,421	9,219
Boone.	1,949	2 679	9,585	25,625	33,065	148,338	417	672	2,758	10	20	73	24,150	28,409	91,763	931	339
Bremer....	251	442	2,374	21,579	30,928	153,855	265	413	1,723	4	4	22	22,127	28,729	116,947	29,218	5,844
Buchanan..	206	280	1,415	44,645	54,420	271,526	105	159	675	52	53	199	15,927	19 505	68,126	10,652	2,020
BuenaVista	1,861	3,527	11,016	23,412	38,778	135,892	436	758	2,311	52	81	232	24,286	34,118	80,507	17,747	515
Butler.	654	1,005	4,946	25,789	37,026	181,199	565	1,025	4 261	18	30	166	12,201	15,241	58,122	7,714	1,405
Calhoun ...	541	877	8,530	21,649	34,318	130,580	263	406	1,306	66	135	363	22,029	30,303	68,586	3,157	137
Carroll.....	4,404	7,996	35,782	25,164	42,964	179,568	105	257	869	16	34	142	16,004	24,803	88,361	1,523	687
Cass...	5,497	8,043	29,499	38,368	58,748	238,285	431	960	2,984	6	12	38	2,497	3,971	13,655	2,626	3,572
Cedar.......	1,115	1,125	6,172	49,561	61,397	397,970	105	171	864	....	....	....	568	632	2,955	903	1,457
CerroGordo	1,554	2,447	11,463	30,358	41,421	187,031	514	753	3,046	47	65	395	14,541	18,320	58,542	15,797	1,191
Cherokee,	4,627	8,308	28,751	26,659	47,296	162,929	440	797	2,476	62	54	159	13,271	18,675	62,107	1,929	90
Chichasaw.	140	240	1,212	27,103	37,838	166,307	277	543	2,288	75	105	215	13,107	17,184	56,204	16,468	1,763
Clarke	1,525	1,604	4,929	47,842	50,560	176,912	159	267	936	1	10	45	331	403	1,501	3,017	420

TABLE No. IV—CONTINUED.

County.	Clover.			Timothy.			Millet and Hungarian.			Alfalfa.			Wild Hay.			Other forage crops—value.	Other farm crops Value.
	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.		
Clay	990	1,851	6,413	25,671	37,289	142,095	281	481	1,357	......	....	.....	23,624	31,190	81,202	1,435	407
Clayton	1,378	2,260	11,294	52,525	72,996	434,417	178	385	1,544	......	....	....	2,108	3,250	16,713	20,725	8,620
Clinton	2,033	1,849	12,270	49,563	58,280	437,706	3,068	2,627	15,491	......	......	....	4,261	5,589	28,817	3,920	25
Crawford	4,747	7,986	33,050	36,577	57,468	247,536	896	1,623	4,942	31	79	365	7,389	11,808	53,341	2,581	1,557
Dallas	4,435	6,214	28,175	26,744	37,723	187,567	465	900	3,257	20	20	95	9,864	12,573	47,081	5,868	971
Davis	1,234	1,530	6,484	54,850	61,984	262,647	1,437	2,094	7,346	6	15	75	117	161	488	519	996
Decatur	463	602	2,241	46,974	58,691	220,993	1,666	2,256	6,146	5	9	36	466	591	1,816	727	187
Delaware	838	1,233	6,439	46,078	59,938	323,857	364	688	3,763	9	18	110	8,065	10,378	44,051	30,144	3,018
Des Moines	1,874	2 378	12,731	26,120	37,580	214,697	189	236	1,124	4	3	21	292	474	1,701	944	254
Dickinson	182	316	1,161	12,611	17,919	57,133	587	834	2,624	37	69	186	17,670	20,061	60,767	3,442	847
Dubuque	750	1,078	6,404	52,472	68,396	505,334	110	204	967	4	7	50	2,141	3,636	19.926	4,147	890
Emmet	496	817	3,729	16,581	21,536	76,571	558	845	2,859	14	16	43	16,236	19 312	48,295	10,897	302
Fayette	408	666	3,299	57,306	77,955	377,181	190	285	1,370	5	7	45	13,210	16,661	61,015	37,028	3,543
Floyd	809	1,433	6,519	29,421	40,703	194,210	684	1,005	4,125	......	.	.	5,357	6,084	23,808	15,085	177
Franklin	1,645	2,234	9,212	27,705	36,471	159,351	197	287	1,029	11	15	76	19,319	19,548	60,011	4,875	1,737
Fremont	2,294	3,465	13,008	15,469	24,595	106,650	275	592	1,819	689	2,123	9,077	4,023	8,275	26,637	1,358	2,878
Greene	2,724	4,497	17,860	26,449	38,020	156,114	323	550	1,694	23	45	155	20,147	25,946	71,646	10,383	778
Grundy	2,185	3,708	17,756	22,864	36,387	176,592	140	278	1,076	17	21	78	9,764	14,270	54,409	6,429	345
Guthrie	4,190	5,843	20,627	31,925	50,538	208,646	154	317	1,075	5	5	20	6,848	8,615	35,003	2,960	168
Hamilton	3,086	5,183	23,671	27,299	42,420	191,922	483	978	3,581	.	......	....	25,722	32,104	105,277	22,899	
Hancock	786	1,306	4,878	23,911	33,125	115,374	358	475	1,657	2	2	10	19,946	21,110	56,685	10,733	238
Hardin	1,109	1,682	7,862	26,449	38,210	179,664	365	555	2,273	5	16	85	16,649	20,224	70,719	13,765	1,599
Harrison	2,728	4,317	15,281	12,404	21,710	84,724	4,044	9,034	22,277	1,238	4,122	15,345	16,382	30,330	90,750	5,725	1,233
Henry	2,301	3,028	13,076	29,003	41,688	212,785	160	579	1,334	1	3	15	26	16	55	3,860	1,391
Howard	358	448	1,860	33,881	43,050	174,513	24	60	150	....	....	....	10,223	12,196	32,527	10,074	

Humboldt	1,833	3,105	11,571	21,159	32,308	128,373	478	1,075	2,802	41	57	224	17,966	20,363	63,724	12,625	
Ida	4,606	8,106	28,608	20,131	32,681	126,241	313	599	1,833	123	166	712	4,125	6,619	25,955	6,832	7,415
Iowa	1,105	1‘394	7,984	42,282	60,128	329,334	533	1,052	5,127	6	8	34	1,666	2,755	10,349	3,069	856
Jackson	872	883	5,200	57,623	68,811	480,471	430	628	3,957	1,216	2,138	7,397	......	......	....	2,125	779
Jasper	3,138	4,192	17,719	39,899	49,999	290,390	553	950	4,206	6	15	75	2,820	3,811	16,709	1,053	1,042
Jefferson	1,626	2,406	9,692	31,305	46,292	225,217	151	324	1,543	......	....	.....	64	52	180	954	1,094
Johnson	856	997	4,658	50,613	106,558	373,317	497	821	3,668	.....	......	.	2,541	3,025	13,059	3,546	
Jones	1,185	1,621	9,728	50,017	70,338	427,827	246	458	2,487	9	16	101	566	820	3,636	20,861	4,859
Keokuk	1,434	1,916	8,553	44,028	57,848	298,067	502	740	3,330		......	.....	520	704	2,594	3,747	3,563
Kossuth	979	1,451	4,999	35,725	42,094	158,311	919	1,272	3,433	10	15	30	77,860	78,400	194,671	22,052	1,048
Lee	1,423	1,976	10,600	43,652	56,072	322,485	529	803	3,483	24	58	428	107	164	660	14,062	1,295
Linn	1,364	1,925	8,759	58,299	78,199	425,586	441	729	2,824	20	31	153	6,012	8,049	35,137	23,740	814
Louisa	814	1,407	6,598	18,445	28,116	148,381	264	462	1,747	..	....		1,929	1,437	4,474	6,848	2,245
Lucas	532	749	3,208	48,050	55,946	229,981	606	860	3,445	8	26	198	318	407	1,573		
Lyon	1,962	3,473	12,776	14,467	24,684	94,917	1,421	2,437	7,050	5	7	29	11,490	17,643	60,315	1,372	1,047
Madison	3,467	5,189	21,751	39,763	58,426	240,626	287	477	1,725	9	14	51	1,684	2,154	7,741	4,574	192
Mahaska	3,196	4,066	23,974	35,887	53,525	276,895	331	634	3,326	15	30	220	1,328	1,646	7,750	8,453	1,165
Marion	3,636	4,294	21,228	33,183	46,711	219,551	258	423	1,994	5	5	20	1,080	1,365	5,953	382	615
Marshall	5,079	7,958	39,476	29,801	41,230	250,042	309	662	2,745	8	19	97	2,614	3,403	16,305	4,107	
Mills	2,207	3,513	13,412	19,517	29,252	121,163	751	1,567	5 393	1,546	5,503	23,178	5,937	9,221	36,966	2,522	1,623
Mitchell	623	1,134	5,902	28,661	36,844	175,694	180	280	1,117	3	3	15	3,074	3,466	13,176	28,825	2,358
Monona	799	1,609	6,333	6 108	10,663	38,263	3,020	6,124	15,307	1,483	1,981	7,992	21,170	37,271	78,495	4,641	3,093
Monroe	534	569	3,359	39,079	44,880	247,387	864	1,414	6,272	1	1	9	355	381	1.851	1,759	
Montgomery	4,488	6,824	28,810	32,096	46,216	207,972	154	239	763	134	449	2,695	1,282	1,878	7,830	1,760	95
Muscatine	268	350	2,176	25,215	31,618	222,453	378	696	3,271	10	20	120	1,674	2,002	8,292	18,753	
O'Brien	971	2,057	6,428	24,741	45,238	142,391	1,138	2,074	5,736	43	129	472	11,838	19,369	54,252	10,022	1,430
Osceola	729	1,119	4,202	15,807	23,325	81,506	599	1,079	2,107	..		..	10,154	13,900	35,962	6,722	966
Page	6,959	10,730	40,790	31,110	52,112	222,619	228	450	1,591	40	140	690	2,458	4,257	16,401	4,490	8,325
Palo Alto	658	1,272	4,565	13,813	17,356	55,044	404	612	1,534	24	28	67	44,590	51,482	108,797	4,237	578
Plymouth	2,947	4,936	17,959	20,248	35,313	159,089	1,001	4,314	15,001	474	1,339	5,953	28,777	44,061	172,574	2,450	1,652
Pocahontas	414	560	2,125	17,290	22,912	91,068	418	667	2,180	26	42	140	34,826	40,593	96,095	7,476	153
Polk	2,307	3,326	14,869	32,543	37,466	200,524	1,356	2,676	12,108	19	49	352	8,353	10,866	45.186	26,402	371
Pottawattamie	7,970	12,989	50,457	36,898	61,424	274,772	4,375	9,624	30,971	1,004	2,986	13,564	14,074	24,492	101,239	3,917	6,895
Poweshiek	2,786	3,785	15,797	41,178	53,197	280,591	253	446	2,073	.....	.	.	1,276	1,702	6,573	7,685	444
Ringgold	1,107	1,231	4,398	54,271	64,761	251,474	748	1,165	3,438	15	39	304	517	613	2,111	1,012	494
Sac	4,140	7,430	29,288	30,105	49,114	186,778	373	776	2,617	24	55	191	14,439	21,872	69,097	6,985	26,499
Scott	849	931	6,735	29,893	34,612	296,590	418	673	3,134	6	8	60	4,529	5,793	39,728	3,680	1,929
Shelby	8,139	12,707	46,771	29,352	51,281	199 862	811	1,860	5,248	42	141	635	6,585	13,181	51,378	2,413	1,374
Sioux	4,351	7,982	32,182	16,624	28,402	118,700	1,377	2,748	8,666	392	1,218	5,814	21,133	32,683	130,508	7,356	
Story	1,527	2,115	10,320	27,963	39,641	197,054	918	1,500	6,481	13	20	115	15,807	19,694	73,803	9,494	740

GROUP II—CONTINUED.

TABLE NO. IV—CONTINUED.

County.	Clover.			Timothy.			Millet and Hungarian.			Alfalfa.			Wild Hay.			Other forage crops—value.	Other farm crops—value.
	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.	Acres.	Tons.	Value.		
Tama	3,937	5,213	26,302	57,268	63,298	358,218	207	284	1,528	24	42	240	5,222	7,356	35,541	2,646	1,967
Taylor	2,608	3,591	12,558	42,628	63,352	258,337	660	1,024	2,8 1	24	35	145	1,356	1,995	6,410	2,721	239
Union	1,180	1,584	5,724	43,270	54,352	189,663	151	206	745	1	1	4	1,176	1,508	4,733	1,504	175
Van Buren	1,869	2,758	11,779	52,774	70,350	278,210	829	1 569	4,969	28	77	357	409	604	2,074	362	2,222
Wapello	911	1,286	5,173	35,916	42,877	225,776	772	1,048	5,174	11	26	148	166	201	723	1,127	1,799
Warren	2,711	3,758	13,125	41,417	55,185	236,762	184	356	986	11	19	72	1,868	2,576	9,415	2,197	2,117
Washington	2,904	4,151	18,607	39,829	55,368	292,699	553	1,095	4,945	29	51	268	230	330	1,246	1,435	5,399
Wayne	423	517	1,699	68,541	75,630	264,013	1,981	3,228	9,585	1	9	45	189	256	725	2,197	176
Webster	1,753	2,799	11,999	24,078	35,197	148,096	377	603	2,157	240	265	1,005	34,829	41,141	129,147	3,706	1,034
Winnebago	1,020	1,538	5,659	16,215	23,151	74,645	232	448	1,733	15	15	30	27,803	34,532	78,847	6,687	419
Winneshiek	1,025	1,978	9,038	47,384	69,908	341,955	349	677	2,980	17	25	100	6,115	7,872	30,366	5,128	5,443
Woodbury	3,728	7,080	26,600	14,363	25,090	92,086	3,521	8,418	28,431	468	1,017	4,081	16,599	28,991	89,160	6,348	6,807
Worth	1,799	3,216	13,688	22,731	30,218	127,453	302	503	1,598	1	3	15	15,815	20,600	69,861	9,257	1,058
Wright	2,622	4,092	16,836	22,850	31,900	138,148	236	321	1,113	23	43	160	19,964	22,350	66,275	9,742	314

GROUP II—CONTINUED.

TABLE NO. V.

Acres, Quantity and Value of Grass Seeds, Potatoes and Sweet Corn, by Counties.

*NOTE—In a number of counties the acreage or quantity of a product was not reported. For these counties the average for all counties reporting has been included in state totals.

County.	Flax Seed.			Clover Seed.			Timothy Seed.			Other Grass Seeds.		Irish Potatoes.		Sweet Potatoes.		Sweet Corn.	
	*Acres.	Bushels.	Value.	*Acres.	Bushels.	Value.	*Acres.	Bushels.	Value.	Bushels.	Value.	Bushels.	Value.	*Bushels.	Value.	Bushels.	Value.
Total for State	*24,997*	*300,943*	*$330,247*	*30,138*	*43,632*	*$234,933*	*332,275*	*1,357,382*	*$1,507,631*	*52,398*	*$37,692*	*16,658,728*	*$4,520,786*	*284,524*	*$141,812*	*1,684,395*	*$594,263*
Adair	....	...	....	1,331	1,298	$ 8,387	10,755	46,083	$ 49,754	792	$ 333	133,852	$ 35,385	785	$ 649	4,362	$ 2,083
Adams	....	...	... ...	522	679	3,642	4,393	23,371	23,693	906	802	.	27,305	1,648	1,122	3,339	1,585
Allamakee..	145	1,993	$ 1,997	241	402	2,685	3,953	20,364	20,996	686	600	162,509	44,478	1,103	315	1,590	961
Appanoose ..	12	74	75	56	57	304	3,665	15,162	15,330	3,054	1,559	85,671	35,378	1,550	1,359	4,481	2,748
Audubon ...	.....	..	....	826	971	5,865	1,791	10,347	9,515	35	9	105,265	26,752	936	878	5,221	1,897
Benton. ..	.. .	....	....	110	69	518	1,301	6,494	6,701	286	258	243,015	60,988	980	462	287,508	71,359
Black Hawk	1	15	15	37	64	435	587	2,615	3,227	1,911	1,123	260,447	70,153	927	270	163,798	42,910
Boone.....	.....	3	4	308	325	2,174	468	1,705	2,009	265	104	188,688	54,860	1,623	806	2,522	1,958
Bremer..	145	1,444	1,475	128	127	721	395	1,156	1,809	573	241	244,787	53,301	1,149	270	65,998	18,244
Buchanan .	......	...	....	4	3	20	811	3,603	3,764	.... .	....	223,020	57,696	117	68	29,058	12,428
Buena Vista	227	3,222	3,030	342	357	2,437	645	3,606	3,201	97	40	148,357	36,922	1,760	475	2,291	1,033
Butler	57	710	707	4	8	36	637	3,524	4,059	177	60	185,869	46,599	462	171	12,239	4,259
Calhoun ..	170	1,765	1,642	96	94	666	659	2,933	3,767	22	19	117,605	33,285	2,213	632	50,851	13,022
Carroll......	35	546	598	821	783	4,971	673	3,168	3,064	30	6	226,773	57,008	874	270	1,502	826
Cass........	......	3	20	1,669	1,452	9,307	1,840	9,401	8,824	700	514	151,142	40,095	535	558	101,894	25,778
Cedar	....	..	.....	17	22	37	2,328	18,662	19,152	.. .	....	149,856	46,157	257	222	3,921	1,741
Cerro Gordo.	436	4,960	5,147	180	401	1,024	940	4,013	4,057	70	70	165,568	43,331	....	....	427	99
Cherokee	174	1,074	1,118	474	523	3,424	828	5,370	4,912	317	190	142,344	37,999	....	....	4,374	1,212
Chickasaw ..	1,903	21,166	27,215	125	139	169	11,937	43,811	43,310	709	645	198,702	45,476	1,762	425	2,241	1,103
Clarke.	.....	..	....	727	740	4,006	15,979	58,827	59,334	726	704	53,361	22,100	2,686	1,343	3,809	2,468

TABLE NO. V—CONTINUED.

County.	Flax Seed.			Clover Seed.			Timothy Seed.			Other Grass Seeds.		Irish Potatoes.		Sweet Potatoes.		Sweet Corn.	
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Bushels.	Value.	Bushels.	Value.	Bushels.	Value.	Bushels.	Value.
Clay	179	1,637	$ 1,623	154	178	$ 1,141	4,165	20,920	$ 20,282	845	$ 413	88,508	$ 24,465	596	$ 163	1,666	$ 983
Clayton	20	289	294	38	278	1,402	51	8,254	9,565	124	42	279,114	73,766	159	245	8,365	5,588
Clinton				26	72	530	581	2,861	4,222	58	266	154,726	53,180	107	72	1,102	627
Crawford				431	385	2,497	501	2,538	2,779	82	28	176,028	48,790	1,053	338	4,705	1,695
Dallas	2	18	16	308	472	2,998	528	2,856	3,985	26	9	152,859	47,180	1,498	1,227	18,928	11,168
Davis	1	10	5	197	401	1,388	18,210	70,000	71,123	3,028	1,655	90,496	24,022	1,406	1,348	4,293	1,838
Decatur				199	203	1,205	9 619	38,182	39,100	2,530	1,589	109,554	29,626	1,149	1,024	4,242	3,010
Deleware				23	30	163	780	4 106	4,678	153	95	193,911	54,077	950	263	11,179	4,359
Des Moines				97	113	688	1,015	7,382	7,186	20	15	172,142	53,181	5,973	3,787	7,021	3,911
Dickinson	462	5,348	5,396	26	207	545	3,817	17,532	17,742	375	253	65,562	19,831	723	241	3,563	2,780
Dubuque					68	400	877	5,450	6,349	121	57	286,506	29,174	771	290	19,485	5,941
Emmet	292	3,705	3,743	41	25	180	2,350	9,440	9,845	220	310	53,272	18 563	688	276	1,456	719
Fayette	521	6,967	6,908		30	75		27,658	28,268	46	130	295,926	75,354	596	410	27,500	9,719
Floyd	801	5,693	5,942	69	106	516	1,525	6,267	6,653	1,654	1,282	245,195	61,776	831	272	3,432	1,292
Franklin	189	1,610	1,612	90	35	243	364	2 136	2,056			178,286	38,267	1,208	450	2,711	1,414
Fremont					698	4,937		1,729	2,280	15	4	123,216	32,035	3,659	2,267	40,855	11,063
Greene	180	1,808	1,677	339	477	2,938	365	1,649	1,792	20	15	151,368	42,911	320	396	5,609	3,292
Grundy	3	50	45	194	283	1,989	996	4,981	5,141	150	30	278,468	68,749	203	201	2,496	1,031
Guthrie	12	174	175		1,622	8,607		25,929	25,872	381	435	127,792	36,966	937	640	5,344	2,425
Hamilton	159	1,681	1,706	107	361	1,824	268	2,085	2,410	187	90	156,304	42,723	374	200	2,020	1,037
Hancock	419	4,115	4,144	91	169	1,125	566	2,227	2,163	846	307	111,100	28,647	641	195	5,111	2,059
Hardin	5	39	39		388	2,622		1,391	1,921	198	114	191,960	48,408	171	244	6,344	2,775
Harrison				574	761	4,436	323	1,917	2,281	398	416	168,723	45,039	2,724	1,362	9,000	3,767
Henry				128	303	1,394	1,862	11,255	11,576	724	309	101,884	28,667	1,276	957	8,472	4,752
Howard	2,902	36,698	37,477	102	275	1,608	21,132	78,260	77,622	105	50	133,986	31,240	268	174	8,647	3,429
Humboldt	192	2,109	2,137	514	679	3,672	457	2,520	2,881	100	50	110,702	29,843	11	5	30	15
Ida					676	4,677		2,607	2,902	302	138	101,459	25,168	312	181	3,102	1,262
Iowa	40	400	400	150	354	1,404	7,830	43,370	44,503	2,898	1,831	237,135	64,596	780	445	26,549	7,643
Jackson				14	25	145		6,446	6,967	165	52	158,520	53,896	2,704	1,007	4,001	2,040
Jasper					367	2,618		4,706	5,675	157	104	209,369	61,084	2,438	1,745	24,046	10,288

Jefferson....	......	......	.....	386	639	2,747	4,486	23,273	24,245	254	665	107,016	30,634	500	470	3,920	2,084
Johnson... .	......	....	....	85	134	693	1,981	10,965	11,087	22	8	169,141	58,635	481	286	1,744	747
Jones	......	....	....	45	56	304	557	3,730	4,896	320	154	169,732	54,555	483	216	19,580	7,305
Keokuk	....	....	...	......	151	1,088	....	10,253	10,542	120	96	170,061	44,987	1,106	1,011	9,702	4,703
Kossuth .	996	10,375	10,251	89	88	351	2,429	8,853	9,033	262	121	186,298	52,705	300	103	2,066	774
Lee........	......	....	....	......	364	2,092	....	38,118	40,166	1,012	642	170,466	58,345	35,454	18,317	12,938	4,984
Linn	6	60	65	22	19	128	702	4,247	5,454	219	205	318,870	97,200	1,575	919	36,415	10,833
Louisa	.....	....	......	23	50	195	633	4,674	5,084	55	56	100,694	30,974	12,816	6,754	20,768	17,064
Lucas.........	45	50	45	171	219	1,083	12,118	49.438	58.835	1,348	1,115	76,858	24,025	535	494	1,748	1,294
Lyon	104	1,210	1,205	347	330	2,346	565	3,035	3,019	1,034	511	144,554	36,691	.....	....	150	82
Madison	......	17	18	410	2,243	11,818	....	33,216	37,364	205	306	108,294	29,286	1,256	1,100	9,330	5,892
Mahaska.	..	....	....	452	1,052	3,886	1,200	6,289	6,360	114	77	158,243	50,613	3,009	1,860	8,035	3,694
Marion!.	....	......	.	670	1,004	5,882	1,161	4,737	4,770	148	202	130,667	39,070	2,578	1,876	5,104	2,569
Marshall. ...	18	163	156	145	187	1,211	610	4,236	4,388	50	20	256,471	66,210	1,130	677	83,304	33,826
Mills.........	2	10	16	169	223	1,566	283	1,476	2,135	1,005	268	135,268	37,494	4,399	2,115	13,021	4,964
Mitchell	....	42,064	42,670	....	69	551	......	10,053	39,926	.....	...	169,659	39,661	24	22	2,319	902
Monona	21	127	132	....	11	45	...	764	1,257	73	115	127,070	34,880	3,397	2,012	5,346	2,229
Monroe	....	....	....	103	65	447	1,515	6,484	6,450	235	111	81,505	33,669	356	248	2,079	1,351
Montgomery.	....	....	....	612	723	4,914	720	3,364	3,420	374	419	97,343	27,859	676	609	12,892	3,534
Muscatine...	....	....	....	....	....	......	351	2,107	2,497	100	30	226,061	74,376	93,609	37,291	3,292	1,583
O'Brien.	327	3,541	4,207	546	1,071	5,214	3,944	22,737	21,840	688	291	123,683	30,427	216	68	2,217	1,103
Osceola	....	5,129	5,112	.....	269	1,672	....	27,447	24,922	139	145	70,189	19,722	541	133	1,035	636
Page	.	5	5	.....	1,001	6,329		4,551	5,183	321	132	132,356	39,245	6,028	3,942	42,046	17,619
Palo Alto	574	6,678	6,547	.	...	.....	583	1,837	2,104	80	115	103,521	34,894	473	169	1,332	767
Plymouth . .	166	1,883	1,927	434	666	2,504	651	4,087	4,430	869	558	183,234	46,558	46	16	2,533	1,398
Pocahontas.	560	6,385	6,542	38	32	189	443	2,176	2,038	332	183	117,003	30,590	920	265	2,722	1,224
Polk	....	....	..	275	354	2 387	146	975	1,042	1,110	722	327,295	119,869	7,298	4,678	91,064	35,728
Pottawattamie......	....	....	....	1,532	2,382	11,160	969	5,569	5,688	966	622	351,549	105,461	14,251	7,365	27,081	13,605
Poweshiek. ..	.	....	....	202	490	3,436	3,331	16,977	16,549	332	235	171,244	45,367	1,887	860	8,953	5,508
Ringgold... .	20	100	100	......	356	2,175	....	47,830	49,803	525	688	651,656	27,473	6,458	1,410	3,753	2,232
Sac	39	498	459	433	590	3,352	1,469	7,661	7,349	22	10	143,035	36,445	24	27	54,824	16,108
Scott.	....	.....	....	....	43	295	....	1,565	2,300	375	185	662,381	166,775	399	341	7,500	2,485
Shelby	......	....	.....	.....	2,821	15,816	964	6,381	6,460	620	2,120	132,797	32,973	2,117	896	26,001	7,592
Sioux...... .	53	579	764	280	381	2,012	497	3,310	3,848	15	20	175,504	44,221	277	124	1,312	724
Story	43	570	556	8	6	51	393	1,488	1,689	255	163	177,083	48,543	1,209	712	17,940	7,895
Tama	4	50	45	183	300	1,992	1,138	5,879	5,963	645	213	247,237	63,415	2,605	653	26,184	9,595
Taylor.	....	.....	....	481	685	3,027	8,174	40,123	40,201	479	316	96,003	38,025	715	739	3,297	2,012
Union	....	....	....	615	609	2,870	9,755	43,653	43,872	120	82	100,130	29,376	419	486	3,037	1,724
Van Buren...	....	..	....	410	488	2,443	7,672	43,148	46,633	1264	954	94,612	27,118	1,957	1,396	7,736	3,989
Wapello	....	.. ...	....	28	38	188	2,297	12,565	13,096	149	94	151,042	46,379	5,821	4,666	10,894	4,529

TABLE NO. V—CONTINUED.

County.	Flax Seed.			Clover Seed.			Timothy Seed.			Other Grass Seeds.		Irish Potatoes.		Sweet Potatoes.		Sweet Corn.	
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Bushels.	Value.	Bushels.	Value.	Bushels.	Value.	Bushels.	Value.
Warren	1	20	$ 15	258	327	$ 2,011	4,051	20,513	$ 20,840	105	$ 75	137,045	$ 44,413	2,617	$ 1,968	9,055	$ 4,100
Washington	....	....	....	190	419	2,529	631	4,199	4,441	728	375	148,069	41,753	1,428	306	7,477	3,931
Wayne	....	....	....	140	281	1,349	22,932	88,339	88,281	4,873	2,253	75,730	24,763	1,828	1,169	4,985	3,023
Webster	218	2,474	2,567	148	85	444	628	2,152	2,247	338	144	168,919	50,041	500	231	3,320	1,658
Winnebago	1,068	12,333	12,303	......	4	19	1,131	4,033	3,622	176	89	71,401	18,454	855	240	26,618	8,024
Winneshiek	3.748	54,586	57,818	183	292	820	13,430	64,160	67,016	912	568	186,964	50,679	3,395	958	2,269	1,061
Woodbury	27	373	376	963	1.150	6,976	969	5,149	5,911	964	607	182,508	54,644	758	423	8,502	4,331
Worth	2,895	34,925	35,952	26	26	152	1,395	6 260	6.655	363	237	68,152	18,634	127	45	399	259
Wright	344	4,399	3,384	188	203	1,288	416	1,937	2,294	....	....	117,880	33,165	375	149	3,556	1,352

GROUP—III.

TABLE NO. I.

Value of Apples, Peaches, Plums, Cherries and Other Fruits, by Counties.

County.	TREE FRUIT.						SMALL FRUIT.			
	Apples.	Peaches.	Plums.	Cherries.	Unclassified.	Total value.	Berries.	Grapes.	Others.	Total value.
	Value.	Value.	Value.	Value.	Value.		Value.	Value.	Value.	
Total for State	*$ 2,597,039*	*$ 118,477*	*$ 329,164*	*$ 520,288*	*$ 54,744*	*$ 3,619,712*	....	....	....	*$ 1,735,842*
Adair	$ 36,888	$ 2,238	$ 3,014	$ 7,655	$ 407	$ 50 202	$ 11,121	$ 3,389	$ 73	$ 14,583
Adams	35,021	4,051	1,512	5,963	86	46,633	10,643	2,823	739	14 205
Allamakee	22,380	47	1,621	67	....	24,115	6,620	557	22	7 199
Appanoose	33,452	164	4.295	5,859	1 901	45.671	12,313	4,621	481	17,415
Audubon	13,590	136	2,687	2.871	21	19,305	7,508	2,074	551	10,133
Benton	33,171	23	5,885	10,935	....	50,014	7 639	2,426	13,231	23.296
Black Hawk	26,732	8	3 336	2,745	154	32 975	15,796	1.250	816	17.362
Boone	30,522	55	3 002	9 308	....	42,887	19 788	912	101	20,801
Bremer	12,505	10	2,001	775	24	15,315	8,889	441	26	9 356
Buchanan	16,339	301	2,516	1,150	38	20.304	17,195	724	....	17,919
Buena Vista	11 346	14	3,947	666	29	16,002	6.322	122	26	6 470
Butler	20,882	40	2,556	926	19	24.423	14,807	553	3	15,463
Calhoun	11,732	28	2,976	1,515	7	16,258	8 822	....	11	8.833
Carroll	16 351	27	3 625	2,882	107	22,992	6,354	391	94	6 839
Cass	20 596	1,722	2 201	5,252	111	29,882	11,329	3,291	....	14,620
Cedar	30,458	525	4,185	10,797	359	46,324	11,674	2 511	23	14 208
Cerro Gordo	....	....	2.933	52	....	24,316	18 937	....	....	18,937
Cherokee	11,096	124	2,941	780	....	14,941	....	....	6 852	6 852
Chickasaw	11,452	4	735	102	....	12,203	8,068	343	....	8,411
Clarke	23,435	913	2,048	3.861	459	30,716	10,445	3,656	51	14,152

GROUP III—CONTINUED.

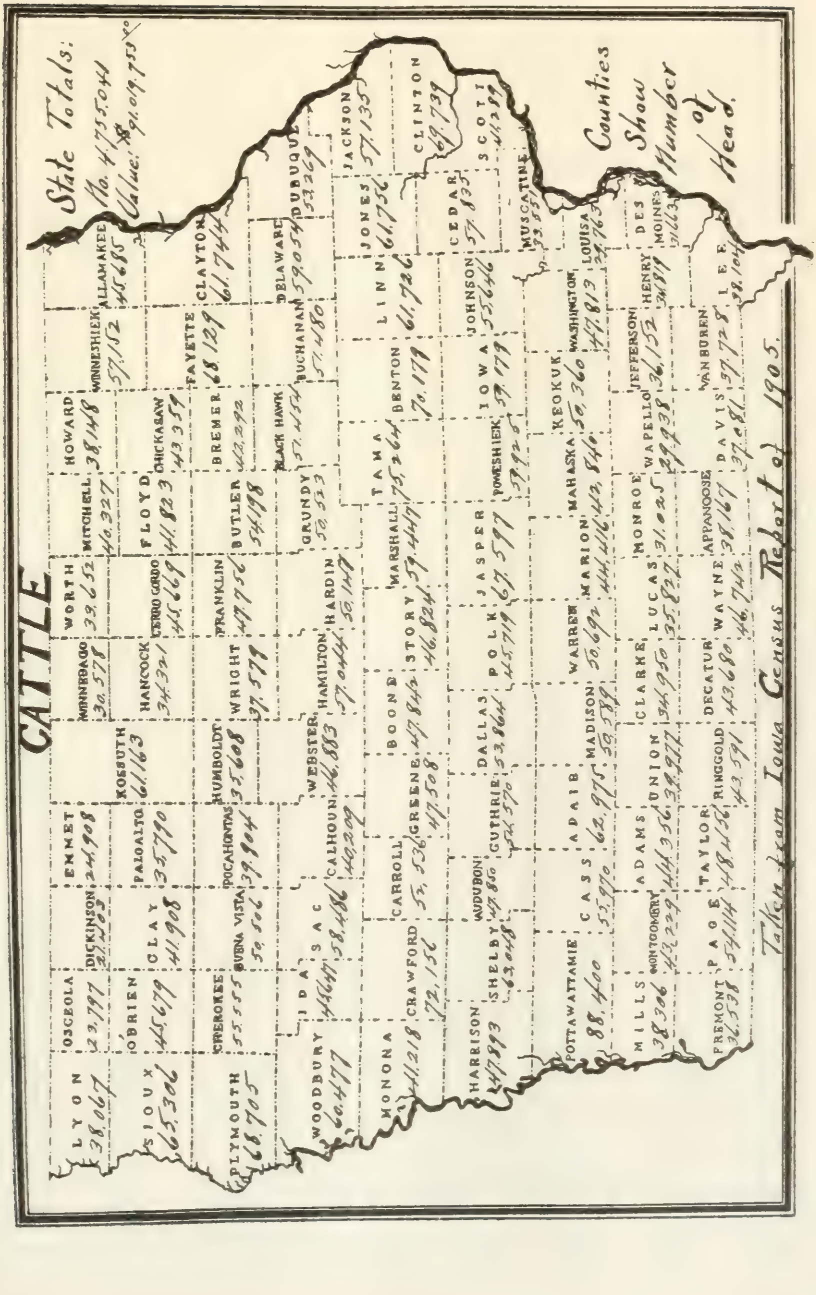
TABLE NO. I—CONTINUED.

County.	TREE FRUIT.						SMALL FRUIT.			
	Apples.	Peaches.	Plums.	Cherries.	Unclassified.	Total value.	Berries.	Grapes.	Others.	Total value.
	Value.	Value.	Value.	Value.	Value.		Value.	Value.	Value.	
Clay	$ 7,997	$ 51	$ 1,932	$ 143	$ 15	$ 10,138	$ 5,526	$ 100	$ 138	$ 5,764
Clayton	41,966	31	4,361	1,461	53	47,872	18,059	276	......	18,335
Clinton	20,858	......	3,609	5,222	......	29,689	17,995	87	......	18,082
Crawford	13,290	70	1,415	3,310	57	18,142	6,039	......	......	6,039
Dallas	50,299	844	5,025	22,327	508	79,003	25,409	......	......	25,409
Davis	31,462	94	2,654	4,023	1,450	39,683	14,300	......	572	14,872
Decatur	30,375	335	1,614	3,091	803	36,218	15,036	......	2	15,038
Delaware	18,417	20	3.112	951	64	22,564	21,750	......	17	21,767
Des Moines	42,506	1,186	2,668	4,248	2,966	53,574	31,799	15,064	10	46,868
Dickinson	4,246	......	1,690	56	503	6,495	6,349	142	376	6,867
Dubuque	27.419	418	3,577	2,079	314	38,807	33,609	1,194	455	35,258
Emmet	4,033	15	1,117	137	......	5,302	4,575	......	......	4,575
Fayette	27,202	13	4,816	616	......	32,647	18,618	......	......	18,618
Floyd	18,589	18	1,968	137	......	20,712	12,377	336	9	12,722
Franklin	14,618	26	2,702	311	30	17,687	9,815	......	......	9,815
Fremont	37,550	29,673	1,934	7,067	464	76,688	20,190	......	......	20,190
Greene	23,949	3	1,736	3,290	......	28,878	10,566	......	......	10,566
Grundy	10,622	83	1,629	1,682	66	14,082	......	9,418	......	9,418
Guthrie	34,296	241	3,888	10,535	276	49,236	15,768	......	......	15,768
Hamilton	15,543	21	5,625	852	62	22,103	6,382	673	......	7,055
Hancock	9,231	55	3.067	83	......	12,436	5,086	......	......	5,086
Hardin	20,158	7	2,703	3,236	......	26,101	......	15.553	......	15,553
Harrison	36 665	1,050	5,100	12,789	2	55,606	21.370	89	......	21,459
Henry	30,986	925	3.082	4,726	2,490	42,209	12,556	13,911	274	6,741
Howard	14,351	1	1,392	4	......	15,748	6,646	103	15	26,764
Humboldt	13,208	22	3,565	467	......	17,262	......	......	9,638	9,638
Ida	7,199	4	2,021	2,043	39	11,306	1,009	156	2,919	4,084
Iowa	42,858	418	4,086	5,913	166	53,441	......	17,496	......	17,496

Jackson	32,388	39	2,044	6,902	62	41,435	12,618	....	....	12.618
Jasper	61,412	872	9,682	15,348	417	87,731	22.821	....	....	22,821
Jefferson	33,593	202	3,242	6,411	1,309	44 756	22,644	....	....	22,644
Johnson	12,985	166	3,341	2,916	....	49 408	....	....	18,337	18,337
Jones	23,916	23	2,306	6,157	45	32 447	11 900	....	....	11,900
Keokuk	44,557	911	3,894	10,850	....	60 242	....	30,489	....	30,489
Kossuth	17,303	60	5,364	460	65	23 252	....	....	11,415	11,415
Lee	42,549	1,950	4,426	5,879	5,723	60 527	....	....	54,999	54,979
Linn	42,392	268	8,519	16,589	195	67,963	12,010	....	28,466	40,486
Louisa	28,630	363	1,999	3,732	....	34 724	....	....	17,544	17,544
Lucas	27,432	1,039	1,494	2,744	....	32 709	....	....	18,492	18 492
Lyon	6,942	....	1,747	141	....	8,830	....	....	2,827	2,827
Madison	39,639	3,039	4,296	9,059	518	56 551	22,388	....	....	22,388
Mahaska	45,490	454	3 596	11 753	....	61.283	25,604	....	....	25,604
Marion	44,765	533	3.367	14 295	1 799	64,759	....	....	....	24,359
Marshall	3.907	122	7.091	13 075	98	24 293	....	....	....	28,788
Mills	36 964	10,504	1,278	6,296	....	55,043	....	....	....	20,743
Mitchell	13,446	17	2,600	87	....	16,150	....	8 282	....	8,282
Monona	19 438	304	4 097	5.029	133	29,001	11,475	....	....	11 475
Monroe	30 571	355	1 458	2 658	....	35.042	....	....	....	19,590
Montgomery	28 538	5,671	2 400	8 347	275	45,231	....	....	....	17,106
Muscatine	25,508	784	2 621	3,371	....	32,284	....	....	....	20 571
O'Brien	10 485	78	3,000	194	....	13,757	....	....	....	7 111
Osceola	4,385	25	2 071	80	13	6,574	....	....	....	2,857
Page	86 952	22,718	9,542	16,018	4 903	139,933	....	....	....	36,045
Palo Alto	11,456	29	3 482	172	....	15,139	....	5 308	....	5,308
Plymouth	8 048	10	2,137	1 963	18	12,176	....	....	....	9,932
Pocahontas	9 917	9	3,497	222	7	13,652	6,667	7	....	6,674
Polk	60 465	193	9 632	37 555	759	108,604	....	....	....	80,906
Pottawattamie	67,656	7,132	12 750	33,475	10	121,028	....	....	....	78 475
Poweshiek	37 512	345	3 204	9 458	....	60 549	....	....	....	23,574
Ringgold	32 486	2,043	1 907	4,675	1,028	42,139				
Sac	13,465	13	2,395	2,131	18,004	36 008	....	....	....	6 861
Scott	29 850	779	3 510	5 022	....	39,161	....	....	....	43,169
Shelby	18,334	248	2,862	4,840	224	26 508	....	....	....	10,572
Sioux	12,279	65	2 145	1 204	....	15,693	.	....	....	5,689
Story	22 042	79	4 355	10 092	125	36,693	....	....	....	16,900
Tama	25 994	48	2,879	5,027	32	33,980	....	....	....	16,933
Taylor	48 747	5 902	2 141	6 987	253	64 030	....	....	....	23,116
Union	31 541	1 837	2 327	7 155	41	42 901	....	....	....	19,468
Van Buren	35 356	189	3.900	5 827	1,730	47,002	....	....	....	22,381
Wapello	34 226	281	3,337	6,281	1,302	45,427	....	....	....	29,471

TABLE NO. V—CONTINUED.

County.	TREE FRUIT.						SMALL FRUIT.			
	Apples.	Peaches.	Plums.	Cherries.	Unclassified.	Total value.	Berries.	Grapes.	Others.	Total value.
	Value.	Value.	Value.	Value.	Value.		Value.	Value.	Value.	
Warren	$ 51,678	$ 1,186	$ 5,669	$ 13 503	$ 287	$ 72,323	....	....	....	$ 26,137
Washington	41,642	673	3,922	8,984	390	58,611	....	....	....	32 478
Wayne	26,838	567	2,067	4,577	847	34,896	....	....	....	16,641
Webster	23,395	107	3,243	1,433	54	28,232	$ 11,771	....	....	11,771
Winnebago	4,836	19	1,095	28	....	5,978	....	....	....	4,269
Winneshiek	22,982	78	1,963	39	15	25,077	14,225	....	....	14,225
Woodbury	17,865	33	4,527	6,074	13	28,512	....	....	....	12,621
Worth	8,927	30	1,408	31	....	10,396	....	....	....	4,767
Wright	13,314	1	3 231	182	....	16,728	8,043	....	....	8 043


CATTLE
State Totals:
No. 4,755,041
Value: $91,019,753.00
Counties Show Number of Head.
LYON 38,067
OSCEOLA 23,797
DICKINSON 27,203
EMMET 24,908
KOSSUTH 61,163
WINNEBAGO 30,578
WORTH 39,652
MITCHELL 40,327
HOWARD 38,148
WINNESHIEK 57,152
ALLAMAKEE 45,685
SIOUX 65,306
O'BRIEN 45,679
CLAY 41,908
PALO ALTO 35,790
HANCOCK 34,321
CERRO GORDO 45,669
FLOYD 41,823
CHICKASAW 43,351
FAYETTE 68,129
CLAYTON 61,744
PLYMOUTH 68,705
CHEROKEE 55,555
BUENA VISTA 50,506
POCAHONTAS 39,904
HUMBOLDT 35,608
WRIGHT 37,579
FRANKLIN 47,756
BUTLER 54,198
BREMER 42,292
BLACK HAWK 57,454
BUCHANAN 57,480
DELAWARE 59,054
DUBUQUE 53,269
WOODBURY 60,477
IDA 46,641
SAC 58,486
CALHOUN 40,209
WEBSTER 46,883
HAMILTON 57,044
HARDIN 50,147
GRUNDY 50,533
TAMA 75,264
BENTON 70,179
LINN 61,726
JONES 61,756
JACKSON 57,135
CLINTON 69,739
MONONA 41,218
CRAWFORD 72,156
CARROLL 52,536
GREENE 47,508
BOONE 47,842
STORY 46,824
MARSHALL 59,447
IOWA 59,179
JOHNSON 55,646
CEDAR 57,835
SCOTT 41,387
MUSCATINE 33,551
HARRISON 47,893
SHELBY 63,048
AUDUBON 47,860
GUTHRIE 54,570
DALLAS 53,864
POLK 45,719
JASPER 67,597
POWESHIEK 57,925
KEOKUK 50,360
WASHINGTON 47,813
LOUISA 34,763
POTTAWATTAMIE 88,400
CASS 55,970
ADAIR 62,975
MADISON 59,589
WARREN 50,692
MARION 44,416
MAHASKA 43,840
MILLS 38,306
MONTGOMERY 43,229
ADAMS 44,356
UNION 39,977
CLARKE 34,950
LUCAS 35,827
MONROE 31,025
WAPELLO 29,938
JEFFERSON 36,152
HENRY 34,817
DES MOINES 31,463
FREMONT 36,538
PAGE 54,114
TAYLOR 48,456
RINGGOLD 43,591
DECATUR 43,680
WAYNE 46,742
APPANOOSE 38,167
DAVIS 37,081
VAN BUREN 37,728
LEE 38,104

Taken from Iowa Census Report of 1905.

GROUP NO. IV.

TABLE NO. I.

Number and Value of Cattle, by Counties.

County.	Calves Under One Year.		Steers One and Under Two Years.		Steers, Two and Under Three Years.	
	Number.	Value.	Number.	Value.	Number.	Value.
Total for State	*1,354,360*	*$11,471,714*	*621,225*	*$11,700,872*	*490,041*	*$ 15,075,776*
Average Value	......	*8.47*	....	*18.84*	....	*30.76*
Adair	19,621	$ 184,056	8,468	$ 175,251	6,442	$ 201,282
Adams	13,846	133,093	5,914	124,959	5,058	158,875
Allamakee	14,807	92,851	4,526	68,612	1,572	40,361
Appanoose	10,581	108,420	5,404	96,880	4,266	124,505
Audubon	14,842	139,489	6,015	115,504	4,329	139,072
Benton	20,477	164,900	10,573	192,701	6,296	186,746
Black Hawk	13,047	92,034	5,440	93,627	4,452	143,180
Boone	14,156	105,528	5,617	95,923	4,108	109,767
Bremer	9,569	56,994	3,323	46,027	1,481	35,840
Buchanan	13,013	89,082	6,265	103,023	4,784	122,110
Buena Vista	14,717	110,566	5,916	102,515	5,244	154,510
Butler	15,455	95,127	6,504	87,288	4,057	111,801
Calhoun	11,890	95,345	4,696	85,737	3,263	100,300
Carroll	16,036	117,160	6,103	97,566	5,185	128,737
Cass	15,273	163,151	8,940	213,206	8,289	328,164
Cedar	17,890	157,624	8,081	159,731	5,225	187,606
Cerro Gordo	12,100	79,131	5,552	86,192	4,809	127,040
Cherokee	13,353	129,408	9,539	206,386	10,505	386,827
Chickasaw	12,816	72,631	3,453	44,028	1,685	33,920
Clarke	10,130	105,456	4,844	96,579	4,245	126,820
Clay	11,657	86,241	5,345	77,636	4,108	92,626
Clayton	18,644	123,590	5,125	76,594	1,979	46,857
Clinton	19,794	136,809	9,047	159,840	9,501	295,749
Crawford	20,502	164,744	10,925	209,257	9,793	300,245
Dallas	13,860	120,803	8,361	180,586	8,816	316,89[illegible]
Davis	10,777	122,611	4,994	113,365	4,158	137,756
Decatur	13,774	131,361	5,775	105,662	3,258	88,964
Delaware	16,561	99,573	5,486	71,753	2,586	49,968
Des Moines	7,561	87,055	6,248	136,709	4,340	163,400
Dickinson	6,419	46,409	2,748	44,237	1,491	38,698
Dubuque	14,395	119,259	5,673	90,349	2,583	67,734
Emmet	7,087	44,207	3,108	44,397	1,814	51,284
Fayette	19,241	121,396	7,785	124,476	3,664	99,481
Floyd	12,8[illegible]	81,467	5,015	77,962	3,521	95,379
Franklin	13,101	83,363	6,388	106,110	5,763	151,312
Fremont	8,350	83,387	6,844	140,771	7,161	230,318
Greene	13,574	121,139	5,610	105,080	5,711	161,551
Grundy	13,873	97,409	6,252	116,117	5,404	159,345
Guthrie	16,580	167,322	7,026	138,513	4,824	146,896
Hamilton	13,438	116,467	6,818	133,971	6,688	175,435

TABLE NO. I—CONTINUED.

County.	Calves Under One Year.		Steers, One and Under Two Years.		Steers, Two and Under Three Years.	
	Number.	Value.	Number.	Value.	Number.	Value.
Hancock	10,037	$ 73,665	3,533	$ 56,253	2,885	$ 67,348
Hardin	14,373	94,948	5,223	79,451	4,827	121,832
Harrison	12,318	96,788	6,224	107,499	6,489	174,850
Henry	8,591	101,717	6,598	161,273	5,432	193,892
Howard	11,599	73,749	3,671	52,972	1,556	35,969
Humboldt	10,635	85,146	4,055	74,062	3,596	111,437
Ida	10,954	99,810	7,700	164,251	9,978	328,478
Iowa	18,247	155,028	7,233	127,044	5,044	159,544
Jackson	17,879	155,003	6,889	130,725	3,801	107,219
Jasper	19,078	173,801	10,278	215,492	9,806	296,587
Jefferson	10,891	125,442	6,115	135,863	4,400	151,639
Johnson	17,783	168,690	6,752	139,572	4,473	150,427
Jones	17,419	137,873	7,200	128,106	6,829	206,680
Keokuk	14,888	155,754	7,182	158,194	5,461	188,285
Kossuth	17,159	107,171	6,247	91,428	3,887	101,902
Lee	11,343	116,335	5,301	114,731	2,736	92,661
Linn	17,181	148,942	8,385	160,514	5,462	164,819
Louisa	8,476	103,778	4,898	110,247	3,760	142,475
Lucas	10,525	113,469	5,362	111,880	3,379	105,970
Lyon	11,127	77,902	4,482	71,908	4,160	111,599
Madison	14,029	158,443	8,612	186,336	5,494	197,900
Mahaska	12,826	123,721	5,382	108,964	4,152	139,695
Marion	12,785	136,762	6,262	130,417	5,344	171,872
Marshall	18,251	147,721	7,322	138,355	6,813	219,464
Mills	9,670	96,927	7,451	151,317	6,089	179,090
Mitchell	11,559	80,858	5,066	83,521	3,616	110,690
Monona	10,262	78,166	5,475	95,176	6,837	186,019
Monroe	9,582	100,862	4,090	84,191	2,204	65,525
Montgomery	12,141	139,275	6,484	171,078	6,926	265,624
Muscatine	9,152	94,042	4,098	90,840	3,239	133,381
O'Brien	13,825	119,962	5,417	98,015	3,914	115,181
Osceola	7,482	52,672	2,385	40,566	1,619	51,338
Page	15,661	150,779	9,047	178,875	6,903	213,169
Palo Alto	10,158	65,920	3,246	49,458	2,617	67,791
Plymouth	18,133	128,963	9,399	171,678	9,872	278,806
Pocahontas	11,452	80,007	4,505	68,407	3,589	94,897
Polk	12,682	103,170	5,592	88,662	4,378	122,410
Pottawattamie	21,279	206,187	14,514	303,266	15,001	501,435
Poweshiek	17,824	164,245	7,910	158,391	7,499	251,787
Ringgold	13,194	135,257	5,569	115,102	4,842	146,533
Sac	17,105	141,955	8,351	138,203	5,666	158,954
Scott	11,113	86,374	3,643	62,756	2,687	73,358
Shelby	19,323	192,718	8,442	166,593	5,947	197,048
Sioux	19,186	141,829	7,548	126,112	6,349	176,659
Story	13,248	98,243	5,800	103,141	4,793	147,588
Tama	21,758	174,543	11,105	204,176	8,497	255,419
Taylor	15,343	149,727	7,090	152,272	4,605	150,685
Union	12,697	124,928	4,960	100,788	3,450	111,744
Van Buren	11,141	140,488	5,827	134,157	3,530	126,957
Wapello	8,787	90,838	3,872	71,969	2,192	56,092
Warren	16,083	150,323	6,974	153,143	5,603	192,239
Washington	12,770	155,531	8,218	198,564	5,754	212,889
Wayne	13,111	134,438	6,320	124,936	5,732	164,527
Webster	12,799	88,713	4,919	83,021	4,586	119,959
Winnebago	9,287	55,516	2,992	38,913	1,480	32,125
Winneshiek	18.290	115,093	5,428	77,283	1,507	41,692
Woodbury	13,854	115,291	10.802	183,186	11,407	367,354
Worth	9,494	57,565	3,478	46,526	2,155	45,993
Wright	10,879	82,393	4,556	75.913	3,234	104,801

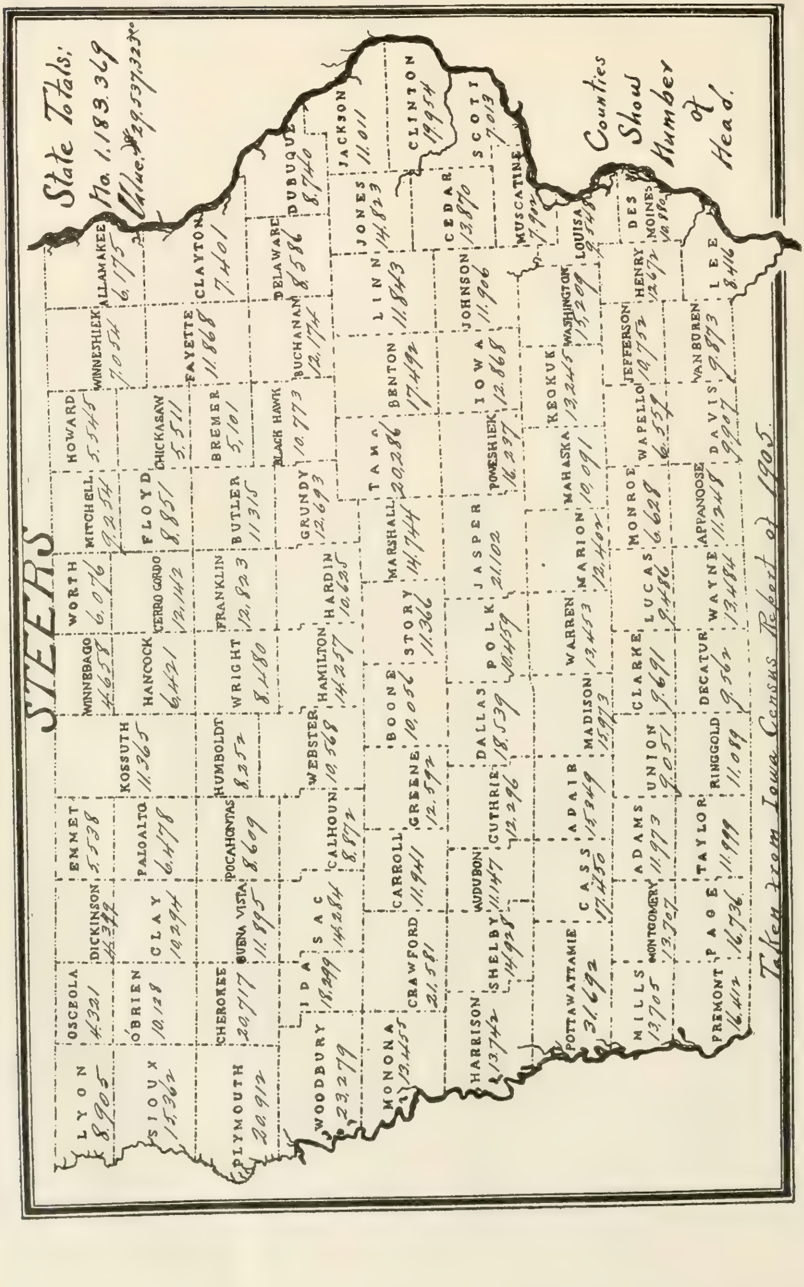
GROUP IV—CONTINUED.

TABLE NO. 2.

County.	Steers, Three Years and Over.		Bulls, One Year and Over.		Heifers, One and Under Two Years.	
	Number.	Value.	Number.	Value.	Number.	Value.
Total for State.... *Average Value...*	*72,103*	*$ 2,760,695* *$38.29*	*87,088*	*$ 3,309,239* *$38.00*	*480,950*	*$ 6,948,542* *$14.45*
Adair	439	$ 15,372	1,044	$ 38,047	6,837	$ 104,991
Adams	1,001	37,574	777	29,467	4,186	64,699
Allamakee	77	3,206	966	32,723	5,300	62,078
Appanoose	1,578	60,136	597	20,201	3,198	46,406
Audubon	803	29,061	989	34,292	5,047	79,946
Benton	623	23,161	1,269	49,348	7,463	107,512
Black Hawk	881	32,345	1,171	43,589	5,381	72,286
Boone	331	10,869	907	30,319	4,839	63,209
Bremer	297	8,971	1,139	29,841	4,409	56,061
Buchanan	1,125	37,545	992	30,342	5,202	68,630
Buena Vista	735	24,676	1,027	40,640	5,410	77,345
Butler	754	24,217	1,121	36,283	6,380	67,869
Calhoun	913	36,924	882	35,866	4,090	62,952
Carroll	653	21,735	1,112	38,047	5,414	69,936
Cass	231	11,034	945	42,858	5,609	100,533
Cedar	564	26,013	1,082	46,728	5,910	89,394
Cerro Gordo	1,781	61,776	866	32,900	4,692	57,786
Cherokee	673	25,413	968	39,772	5,601	87,295
Chickasaw	373	11,018	897	25,367	4,881	64,809
Clarke	602	27,541	563	20,412	3,337	50,955
Clay	841	25,447	799	32,169	4,595	57,521
Clayton	297	10,246	1,496	48,069	7,160	98,748
Clinton	1,406	54,514	1,351	47,438	6,734	96,366
Crawford	863	35,272	1,306	49,387	7,396	108,762
Dallas	1,362	52,571	802	30,992	4,564	65,536
Davis	755	32,322	505	19,484	3,624	57,548
Decatur	529	25,509	630	25,339	3,649	57,636
Delaware	514	20,550	1,298	40,851	6,078	67,588
Des Moines	292	11,437	413	14,436	2,472	43,743
Dickinson	160	5,367	425	16,465	2,347	15,264
Dubuque	484	16,551	1,097	39,597	5,454	76,818
Emmet	616	25,141	466	17,398	2,799	29,718
Fayette	419	14,585	1,357	45,657	7,021	82,530
Floyd	315	12,878	858	31,656	4,694	59,838
Franklin	672	21,271	974	31,735	4,727	63,997
Fremont	2,407	93,248	380	14,896	2,508	34,271
Greene	1,271	48,278	840	38,386	4,811	69,905
Grundy	1,037	35,582	937	30,944	5,284	68,776
Guthrie	446	15,262	1,049	45,079	5,743	89,027
Hamilton	751	26,827	928	32,490	4,218	58,875
Hancock	503	20,725	787	29,311	3,617	48,742
Hardin	575	18,804	1,068	32,243	5,059	56,614
Harrison	1,029	38,583	812	29,931	4,973	60,491
Henry	642	25,327	395	17,615	3,889	48,995
Howard	318	10,653	1,115	25,762	4,347	50,287
Humboldt	601	21,168	690	21,306	3,472	54,261
Ida	621	35,025	743	33,044	4,238	71,078
Iowa	591	19,763	1,019	48,799	6,615	102,332
Jackson	321	9,884	1,004	37,078	6,017	93,858
Jasper	1,018	44,169	1,198	49,990	6,388	103,784

TABLE NO. 2—CONTINUED.

County.	Steers, Three Years and Over.		Bulls, One Year and Over.		Heifers, One and Under Two Years.	
	Number.	Value.	Number.	Value.	Number.	Value.
Jefferson	237	$ 10,225	438	$ 18,484	3,040	$ 51,602
Johnson	681	29,056	1,014	45,113	6,123	102,817
Jones	794	43,390	1,087	42,795	6,004	86,319
Keokuk	602	25,080	853	36,303	4,574	72,514
Kossuth	1,231	45,696	1,352	42,142	6,593	66,406
Lee	379	17,855	526	21,467	3,933	67,998
Linn	996	41,108	1,163	44,427	5,634	90,875
Louisa	890	38,693	464	17,845	2,922	45,063
Lucas	745	4,240	623	24,770	3,477	54,366
Lyon	263	8,660	820	29,335	4,272	57,961
Madison	1,831	89,020	718	31,750	4,646	75,595
Mahaska	557	21,920	699	28,997	4,179	69,484
Marion	796	35,832	660	23,804	4,360	69,833
Marshall	609	25,094	1,062	40,573	5,870	81,605
Mills	165	6,199	481	22,296	3,365	51,480
Mitchell	572	24,901	831	33,329	4,627	59,926
Monona	1,143	37,787	625	22,182	3,894	53,358
Monroe	334	12,242	531	18,651	3,275	54,210
Montgomery	297	12,795	722	33,784	3,951	75,646
Muscatine	565	21,668	681	30,850	3,203	59,258
O'Brien	797	29,781	979	43,603	5,059	81,402
Osceola	317	11,263	543	19,234	2,738	38,340
Page	786	35,288	791	31,324	4,691	74,061
Palo Alto	615	19,635	739	24,733	3,585	44,596
Plymouth	1,641	57,876	1,237	56,373	7,256	103,591
Pocahontas	515	17,066	859	31,315	3,910	55,285
Polk	489	17,424	727	28,185	4,063	54,969
Pottawattamie	2,177	85,939	1,334	60,329	8,158	134,209
Poweshiek	828	36,196	1,033	43,810	5,908	89,155
Ringgold	678	27,805	656	24,989	4,157	60,978
Sac	267	8,666	1,112	51,953	6,613	96,021
Scott	683	26,257	1,004	33,523	4,406	69,435
Shelby	539	22,804	1,159	59,036	7,041	113,937
Sioux	1,465	51,063	1,256	50,412	7,073	101,703
Story	773	32,277	927	28,057	4,668	62,517
Tama	684	22,985	1,356	56,479	8,598	118,165
Taylor	304	12,117	757	37,330	4,685	71,415
Union	641	22,636	642	25,359	3,783	58,191
Van Buren	516	18,053	593	26,468	3,797	69,755
Wapello	495	20,829	453	14,090	3,171	47,098
Warren	876	37,767	757	27,849	4,830	78,914
Washington	1,237	57,365	710	32,263	4,523	84,577
Wayne	1,432	55,677	744	32,275	4,460	70,842
Webster	1,063	33,640	905	31,407	4,907	65,667
Winnebago	186	4,478	684	20,647	3,067	35,525
Winneshiek	119	3,116	1,320	39,511	6,825	87,273
Woodbury	1,070	49,335	766	34,138	5,978	85,004
Worth	443	13,200	841	25,236	3,553	39,095
Wright	69	23,150	797	28,825	3,826	52,905


STEERS
State Totals;
No. 1,183,369
Value $29,537,325.00
Counties Show Number of Head.
Taken from Iowa Census Report of 1905.
LYON 8,905
OSCEOLA 4,321
DICKINSON 4,377
EMMET 5,538
KOSSUTH 11,365
WINNEBAGO 4,658
WORTH 6,076
MITCHELL 9,254
HOWARD 5,545
WINNESHIEK 7,054
ALLAMAKEE 6,175
SIOUX 15,362
O'BRIEN 10,128
CLAY 10,294
PALO ALTO 6,478
HANCOCK 6,421
CERRO GORDO 12,142
FLOYD 8,851
CHICKASAW 5,511
FAYETTE 11,868
CLAYTON 7,401
PLYMOUTH 20,912
CHEROKEE 20,717
BUENA VISTA 11,895
POCAHONTAS 8,609
HUMBOLDT 8,252
WRIGHT 8,480
FRANKLIN 12,823
BUTLER 11,315
BREMER 5,101
BLACK HAWK 10,773
BUCHANAN 12,174
DELAWARE 8,586
DUBUQUE 8,740
WOODBURY 23,279
IDA 18,299
SAC 14,284
CALHOUN 8,872
WEBSTER 10,568
HAMILTON 14,257
HARDIN 10,625
GRUNDY 12,693
MONONA 13,455
CRAWFORD 21,581
CARROLL 11,941
GREENE 12,592
BOONE 10,056
STORY 11,366
MARSHALL 14,744
TAMA 20,286
BENTON 17,492
LINN 11,843
JONES 14,823
JACKSON 11,011
CLINTON 19,954
HARRISON 13,742
SHELBY 14,928
AUDUBON 11,147
GUTHRIE 12,296
DALLAS 18,539
POLK 10,459
JASPER 21,102
POWESHIEK 16,237
IOWA 12,868
JOHNSON 11,906
CEDAR 13,870
SCOTT 7,013
MUSCATINE 7,902
POTTAWATTAMIE 31,692
CASS 17,250
ADAIR 15,349
MADISON 15,973
WARREN 13,453
MARION 12,402
MAHASKA 10,091
KEOKUK 13,245
WASHINGTON 15,209
LOUISA 9,548
MILLS 13,705
MONTGOMERY 13,707
ADAMS 11,973
UNION 9,051
CLARKE 9,691
LUCAS 9,486
MONROE 6,628
WAPELLO 6,557
JEFFERSON 10,752
HENRY 12,672
DES MOINES 10,980
FREMONT 16,412
PAGE 16,736
TAYLOR 11,999
RINGGOLD 11,089
DECATUR 9,562
WAYNE 13,484
APPANOOSE 11,248
DAVIS 9,907
VAN BUREN 9,873
LEE 8,416

GROUP NO. IV—CONTINUED.

TABLE NO. 3.

County.	Milch Cows, Two Years and Over.		Cows, not Milch.		Total Cattle.	
	Number.	Value.	Number.	Value.	Number.	Value.
Total for State. ..	*1,315,888*	*$31,152 802*	*333,336*	*$ 8,600,133*	*4,755,041*	*$ 91,019,753*
Average Value...	....	*23.67*	....	*25.80*	....	*19.15*
Adair.	14,592	$ 333,516	5,532	137,599	62,975	$ 1,190,714
Adams	9,177	187,849	4,397	110,606	44,356	847,125
Allamakee	16,355	321,598	2,082	46,633	45,685	668,062
Appanoose..........	9,961	229,268	2,582	62,810	38,167	748,632
Audubon	13,352	348,748	2,473	60 727	47,850	946 829
Benton.	16,409	363 402	7 069	166 734	70 179	1 254 504
Black Hawk.... ..	19 354	427,437	1 728	53.769	51 454	958 267
Boone	15 073	361 818	2 811	60 904	47.842	838.337
Bremer	21 367	464 201	707	17,167	42 292	715 102
Buchanan.	18,253	418,285	1 846	43 679	51,480	912 696
Buena Vista	13,755	318,030	3,702	93,498	50,506	921,780
Butler	17,843	395,072	2,084	55,477	54,198	873,134
Calhoun.	11,456	285,710	3,019	78,818	40,209	781,652
Carroll.	14,815	321,000	3,218	72,016	52,536	866,197
Cass	10,337	295,467	6,346	185,879	55,970	1,340,282
Cedar	11,840	253,936	7,243	180,136	57,835	1,101,168
Cerro Gordo.	13,846	327,226	2,023	48,568	45,669	820,619
Cherokee	9,858	239,586	5,058	125,742	55,555	1,240,429
Chickasaw...... ...	18,006	391,221	1,247	28,750	43,359	661,744
Clarke.	8,369	212,588	2,860	72,417	34,950	712,768
Clay	12,103	273,938	2,460	68,254	41,908	713,832
Clayton..	24,307	535,322	2,736	65,730	61,744	1,005,156
Clinton	19,428	435,598	2,478	67,512	69,739	1,293,826
Crawford ..	14,678	340,630	6,693	158,427	72,156	1,366,724
Dallas	12,872	310,440	3,227	82,319	53,864	1,160,146
Davis	9,724	229,503	2,544	60,026	37,081	772,615
Decatur	13,243	240,276	2,822	69,948	43,680	744,695
Delaware	25,296	521,871	1,235	22,025	59,054	894,179
Des Moines.........	7,525	213,662	2,812	74,386	31,663	744,828
Dickinson	6,743	168,570	1,070	24,807	21,403	379,817
Dubuque	21,341	502,953	2,242	63,694	53,269	976,955
Emmet	7,567	177,704	1,451	39,265	24,908	429,114
Fayette	27,164	656,484	1,478	36,564	68,129	1,181,173
Floyd	13,051	309,722	1,534	34,577	41,823	698,479
Franklin	13,862	299,396	2,269	51,140	47,756	813,324
Fremont............	6,207	154,116	2,681	69,511	36,538	820,518
Greene	12,209	298,788	3,482	96,975	47,508	940,102
Grundy..	14,355	313,750	3,381	76,024	50,523	897,947
Guthrie	13,698	333,940	5,204	128,428	54,570	1,064,377
Hamilton	22,903	382,339	1,300	35,982	57,044	963,386
Hancock	12,288	289,162	1,171	31,438	34,321	616,644
Hardin	16,113	347,519	2,909	62,377	50,147	813,788
Harrison	12,638	285,892	3,410	87,214	47,893	881,248
Henry	7,512	205,213	1,760	53,433	34,819	807,465
Howard	14,384	322,943	1,158	29,492	38,148	601,827
Humboldt..........	10,567	272,401	1,992	50,356	35,608	697,137
Ida	7,850	204,001	3,563	106,042	45,647	1,041,729
Iowa	14,450	360,750	5,980	176,075	59,179	1,149,335
Jackson.	18,379	449,875	2,845	72,197	57,135	1,055,839
Jasper.......	13,285	317,320	6,546	175,257	67,597	1,376,400

TABLE NO. 3—CONTINUED.

County.	Milch Cows Two Years and Over.		Cows, not Milch.		Total Cattle.	
	Number.	Value.	Number.	Value.	Number.	Value.
Jefferson	8,696	$ 217,171	2,335	$ 62,036	36,152	$ 772,462
Johnson	10,109	272,750	8,711	224,124	55,646	1,132,549
Jones	19,778	488,152	2,645	67,050	61,756	1,200,365
Keokuk	10,894	284,331	5,906	154,370	50,360	1,074,831
Kossuth	22,483	465,170	2,211	53,377	61,163	973,292
Lee	10,917	294,589	2,869	79,759	38,104	805,395
Linn	20,927	536,850	9,578	58,820	61,726	1,246,355
Louisa	5,988	161,882	2,365	66,822	29,763	686,805
Lucas	7,493	190,000	4,223	110,923	35,827	715,618
Lyon	11,129	272,208	1,814	43,166	38,067	672,739
Madison	10,393	269,011	4,866	128,430	50,589	1,136,485
Mahaska	11,627	264,970	3,418	94,511	42,840	852,262
Marion	9,705	244,637	4,504	103,753	44,416	916,910
Marshall	13,939	318,382	5,581	131,262	59,447	1,102,456
Mills	6,567	176,963	4,518	120,692	38,306	804,964
Mitchell	12,657	301,081	1,399	38,472	40,327	732,778
Monona	9,049	214,442	3,933	83,692	41,218	770,822
Monroe	9,172	235,740	1,837	55,190	31,025	626,611
Montgomery	7,214	206,077	5,494	146,394	43,229	1,050,673
Muscatine	8,904	245,152	3,709	113,219	33,551	788,410
O'Brien	12,831	324,432	2,857	87,480	45,679	899,856
Osceola	7,479	178,689	1,234	32,630	23,797	424,732
Page	11,106	283,778	5,129	124,592	54,114	2,061,866
Palo Alto	13,426	315,891	1,404	37,584	35,790	625,608
Plymouth	15,280	360,463	5,887	128,347	68,705	1,286,097
Pocahontas	12,724	279,796	2,350	82,010	39,904	708,783
Polk	14,756	367,097	3,032	94,088	45,719	876,005
Pottawattamie	18,377	486,428	7,560	194,387	88,400	1,972,180
Poweshiek	12,337	306,463	6,586	170,703	59,925	1,220,750
Ringgold	12,372	315,564	2,123	62,131	43,591	888,359
Sac	13,240	314,744	6,132	159,812	58,486	1,070,308
Scott	15,341	424,586	2,412	62,430	41,289	838,719
Shelby	13,197	329,527	7,400	203,288	63,048	1,285,851
Sioux	16,659	383,125	5,770	144,041	65,306	1,174,944
Story	14,265	341,526	2,350	60,715	46,826	874,085
Tama	15,822	376,801	7,444	186,483	75,264	1’395,051
Taylor	11,899	300,632	3,773	96,882	48,456	971,060
Union	10,058	259,228	3,746	94,394	39,977	797,268
VanBuren	8,657	234,080	3,667	109,187	37,728	859,145
Wapello	9,437	237,809	1,531	35,153	29,938	573,878
Warren	12,591	208,068	2,978	77,434	50,692	1,025,737
Washington	9,770	275,589	4,831	145,178	47,813	1,161,956
Wayne	10,824	257,618	4,119	110,697	46,742	951,010
Webster	15,350	369,494	2,354	56,967	46,883	848,868
Winnebago	11,595	258,081	1,287	27,350	30,578	472,935
Winneshiek	21,508	473,375	2,255	51,818	57,252	889,161
Wooddury	13,240	343,568	3,360	84,924	60,477	1,272,800
Worth	12,289	245,290	1,399	29,718	33,652	496,623
Wright	12,057	291,466	1,540	42,218	37,579	701,671

GROUP NO. IV—CONTINUED.

TABLE NO. 4.

Number and Value of Cattle Eligible to Registry, by Counties.

County.	Shorthorn.		Polled Durham.		Hereford.		Angus.		Galloways.		Red Polled.		Jerseys.		Others.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Total for State ...	*44,533*	*$2,331,702*	*14,452*	*$692,861*	*11,607*	*$622,055*	*11,458*	*$699,041*	*1,676*	*$82 838*	*2,529*	*$115,367*	*1,034*	*$44,171*	*2,099*	*$109,602*	*89 388*	*$4.697,617*
Average Value	.....	52.36	.	47.94	.....	53.59	...	60.17		49.43	.....	45 62	..	42.72	...	52.22	...	53.15
Adair	502	$ 22,841	45	$ 2,615	210	$ 9,577	260	$ 14,669	..	......	26	$ 1,045	5	$ 145	5	$ 270	1,053	$ 51,162
Adams	531	24,390	123	9,476	153	7,770	118	5,835			3	250	..	...	.....	.....	928	47,721
Allamakee	494	21,674	174	7,950	22	1,460	100	5,630	5	190	28	1,310	2	50	8	510	833	38,774
Appanoose	648	22,124	72	2,982	138	9,005	104	7,543	1	100	1	100	15	305	72	1,591	1,051	34,750
Audubon. .	457	22,673	14	735	50	4,181	2	175	15	840	8	430	7	460	18	900	571	30,694
Benton	778	37,260	362	10,654	252	11,765	95	5,988	225	7,581	4	185	15	464	109	2,835	1,840	76,732
BlackHawk	200	13,515	192	11,285	51	3,820	212	16,125	2	200	38	1,747	4	185	13	800	715	47,677
Boone.	236	12,463	140	8,118	35	2,895	57	3,275	..	.....	28	1,093	2	40	9	320	507	28,204
Bremer.....	116	7,827	44	2,220	55	1,625	38	1,829	..	...	25	1,010	6	200	12	850	296	18,591
Buchanan..	51	3,345	282	11,148	106	4,830	68	3,320	3	160	....	....		...	5	273	515	23,076
BuenaVista	256	13,538	361	20,445	268	7,567	303	20,985	...		21	2,035	27	1,314	54	2,240	1,290	68,124
Butler ..	96	8,025	55	3,605	226	2,860	39	2,660	16	1,000	22	1,325			58	6,450	512	25,925
Calhoun ..	348	20,539	25	1,575	157	9,555	144	8,085	4	2,140	4	225	7	380	62	3,105	751	45,604
Carroll......	400	24,906	......	....	83	4,280	51	3,315	...	.	21	860	9	290	....	....	564	33,651
Cass	1,157	64,508	94	5,153	320	22,370	93	6,095	1	100	24	2,475	21	1,035	5	210	1,715	101,946
Cedar	1,075	42,420	49	3,345	591	26,353	220	6,186	5	164	69	3,925	1	50	9	656	2,019	83,049
CerroGordo	327	13,740	204	11,078	143	8,145	135	11,870	2	135		....	113	5,175	.	....	924	50,143
Cherokee...	363	15,972	131	6,738	57	3,330	179	10,542	8	480	...	...	3	105	10	480	751	37,647
Chickasaw .	111	5,725	105	5,334	12	855	13	1,367		...	14	820	1	65	27	1,415	283	15,581
Clarke. ...	538	22,755	100	3,067	44	2,460	54	2,570	6	265	2	140	30	1,125	19	668	798	33,050

TABLE NO. 4—CONTINUED.

County.	Shorthorn		Polled Durham.		Hereford.		Angus.		Galloway.		Red Polled		Jerseys.		Others.		Total.	
	Number	Value.	Number.	Value.	Number.	Value.	Number	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Clay. ..	500	$ 27,591	600	$ 22,563	120	$ 400	120	$ 7,350	1	$ 100	70	$ 1 650	1	$ 10	3	$ 165	1,415	$ 63,429
Clayton ..	475	21,098	393	15,483	13	830	149	8,420	28	2,350	31	1,575	21	830	12	650	1,125	51,236
Clinton.. ..	479	17,475	76	4,300	82	3,523	97	6,546	....	.	55	2,005	1	40	37	2,210	837	36,129
Crawford	294	17,084	213	8,713	187	8,927	206	10,465	.	...	10	565			6	150	916	45,904
Dallas	400	19,349	70	2,750	146	8,641	173	8,546	5	300	2	95	3	155	51	3,030	853	42,866
Davis.	362	13,882	1	55	173	9,380	318	15,433		.	3	130	7	203			864	39,083
Decatur. ..	589	20,705	318	16,230	301	15,592	56	4,120	18	910	5	500	14	567	11	560	1,312	59,484
Delaware .	115	6,028	290	13,324	135	12,845	52	4,035	..		7	500	6	221	25	1,110	630	38,093
Des Moines	124	5,220	187	11,055	52	3,260	89	4,200	....	...	13	1,300	13	455	1	50	479	25,540
Dickinson.	236	15,570	66	2,410	4	355	18	1,725		..	21	1,160	1	50	6	400	352	21,670
Dubuque	291	12,992	96	4,163	669	17,123	44	2,750		...	57	1,000	..	..	3	225	1,160	38,253
Emmet. ..	264	17,087	18	1,075	10	1,130	1	50	131	8,390	12	910	..	. .	3	180	439	28,822
Fayette ...	288	12,643	439	21,807	23	1,630	241	14,575	49	1,980	4	144	3	155	130	6,370	1,177	59,304
Floyd.	222	13,820	171	9,786	21	1,633	199	10,640	1	60	29	1,465	2	50	28	1,355	673	38,809
Franklin	335	13,698	136	6,046	43	1,473	10	772	..	.....	4	195	2	56	174	6,500	704	28,740
Fremont .	143	8,020	5	215	33	6,040	37	2,075	..		114	5,544	..		1	40	333	21,934
Greene	636	31,771	7	560	69	4,865	226	19,585	4	400	27	825	1	30	..	.	970	58,036
Grundy..	237	12,311	122	3,186	38	2,380	59	5,050			5	280			.	. .	461	23,207
Guthrie	383	21,643	19	1,460	458	21,893	183	9,322	1	10	50	2,045	59	2,195	6	303	1,159	58,871
Hamilton .	318	54,800	217	10,202	21	1,429	44	3,275	23	885	80	4,750	1	50	..	. .	704	75,391
Hancock.	177	13,270	44	2,730	29	2,325	16	2,000	..	..	12	880	5	200	4	375	287	21,780
Hardin. ...	709	28,428	3	130	57	4,390	13	750	1	40	12	536	5	185		.	800	34,459
Harrison .	199	10,459	79	3,735	169	9,991	90	4,338		... ..	65	3,594	5	176	3	175	610	32,468
Henry ...	109	4,680	16	870	59	9,180	105	7,935	...		....		9	520	41	6,769	339	20,954
Howard ...	311	17,342	68	3,940	58	4,670	77	5,410	3	239	12	688	19	985	68	2,246	616	35,520
Humboldt	380	18,329	44	2,577	10	640	58	8,720		.	16	866	5	200	30	1,275	543	32,607
Ida ...	452	35,776	41	2,380	36	2,930	119	9,070	1	50	18	985		. .	32	1,175	699	52,366
Iowa ...	1,025	50,335	67	3,270	94	5,997	206	16,756	54	2,085	1	60	13	813	5	245	1,465	79,561
Jackson	236	15,762	54	2,995	24	1,740	90	5,130	1	125	108	6,525	6	150	57	3,547	576	35,974
Jasper.	1,109	60,113	187	10,269	123	6,955	311	18,781	14	190	4	110	27	790	22	2,120	1,797	99,658

Jefferson .	362	14,220	236	9,448	48	3,895	42	2,935	55	2,395	47	1,808	12	585	.....	......	802	35,286
Johnson .	681	37,835	95	3,222	172	10,787	237	12,390	41	2,070	8	540	.....	....	27	2,314	1,261	69,158
Jones	645	40,123	3	120	181	10,040	132	8,195	..	......	54	1,895	.....	.....	30	1,500	1,045	61,873
Keokuk ...	575	24,092	420	21,053	35	2,345	244	13,929	105	1,745	1	30	27	860	9	160	1,416	67,514
Kossuth ...	544	26,623	58	2,800	43	1,855	136	8,520	11	550	114	4,642	3	120	8	180	917	45,290
Lee	245	15,971	185	10,295	4	360	104	6,525	....	......		....	9	365	3	186	550	33,702
Linn	719	35,599	397	19,124	49	2,844	142	8,061	1	75	231	7,110	32	1,55[illegible]	5	192	1,576	74,560
Louisa	339	15,870	92	4,240	18	1,719	147	6,687	.....	....	.	...	1	36	32	1,100	629	29,952
Lucas	535	22,413	229	11,514	85	4,395	26	1,320	...	.	54	1,730		....	7	300	936	41,672
Lyon	687	29,479	117	6,435	11	910	9	470	2	140	39	1,027	1	75	.....	......	866	38,536
Madison .	341	18,234	52	2,433	64	2,858	515	19,102		...	1	75		..	3	102	976	42,804
Mahaska .	551	30,939	105	4,933	149	9,704	176	13,752	1	50	35	1,270	33	1,225	129	8,215	1,179	70,118
Marion ...	300	11,484	37	1,720	16	890	147	7,348	.....	....	7	595	20	163	12	780	539	23,280
Marshall .	1,330	56,362	1	32	65	2,241	29	1,645	1	60	55	2,585	12	435	1	20	1,494	63,380
Mills	318	13,831	148	7,190	126	6,630	77	8,540	....		1	75	5	200	62	3,265	737	19,741
Mitchell ...	438	26,660	250	13,016	70	4,665	88	6,600	.		13	2,840	1	70	12	675	902	54,526
Monona ...	49	2,397	72	3,720	78	5,755	14	790	9	315	7	380	1	50	.....	... .	230	13,407
Monroe	70	3,768	110	5,373	116	11,570	4	375	91	4,700	22	820	9	350	2	150	427	27,106
Montgomery . .	247	13,333	85	5,045	120	8,325	82	5,625	18	908	7	410	6	160	. ...	....	565	33,806
Muscatine .	585	30,257	43	2,725	290	11,598	85	1,357	...	..	5	250	1	50	13	475	1,022	49,712
O'Brien	550	32,225	227	13,047	111	7,715	134	10,725	7	445	12	610	3	285	12	240	1,056	65,292
Osceola .	93	5,130	34	1,985	27	2,546	45	3,605	27	550	5	450	1	40	3	270	235	14,576
Page	585	30,883	114	5,799	109	4,266	21	1,420	40	2,000	86	1,950	17	389	1	25	973	46,732
Palo Alto	229	16,061	126	9,306	11	506		... .	1	60	1	75	2	65	6	300	376	26,373
Plymouth	291	21,577	110	6,410	133	8,395	39	2,375	7	665	10	925	3	150	.....	.. ....	593	40,497
Pocahontas	776	62,499	268	12,442	96	5,076	44	2,580	4	300	4	205		... ..	25	558	1,217	83,660
Polk . ..	658	45,411	12	655	136	9,252	100	5,550	28	1,250	1	100	8	410	21	1,075	964	63,733
Pottawattamie	472	37,036	204	11,340	202	18,050	180	12,640	20	2,000	19	1,102	64	3, 90	4	183	1,165	85,441
Poweshiek .	812	47,901	125	4,140	105	6,063	221	13,807	22	950	6	355	1	130			1,295	73,346
Ringgold . .	889	35,729	77	3,510	216	12,337	90	3,825	1	50	1	56	4	50	3	165	1,278	55,722
Sac	704	39,457	162	7,409	325	2,060	335	24,777	8	545	57	2,795	20	6[illegible]0		.	1,611	77,703
Scott	326	16,855	151	5,960	13	674	191	7,745	...	....	110	5,650	13	1,025	10	590	814	38,499
Shelby	724	44,945	394	19,962	256	16,520	267	20,978	2	195	4	375	1	30	85	4,585	1,733	107,590
Sioux .	530	51,824	371	15,297	191	12,265	10	565	77	3,268	31	1,71[illegible]	8	350	64	2,835	1,282	88,114
Story	604	31,346	68	3,740	40	2,460	86	5,542	3	220	23	980	8	105	35	2,235	867	46,928
Tama	692	29,324	347	16,854	86	5,666	206	16,567	61	1,855	3	140	4	260	143	7,025	1,542	77,691
Taylor	373	15,198	781	9,699	41	2,381	98	5,403	52	2,600	43	1,220	4	230	14	675	806	37,406
Union	297	17,318	85	3,495	133	6,345	140	5,475	13	400	4	230	9	160			681	33,723
Van Buren	273	16,157	636	26,937	348	19,160	181	12,302	94	6,567	....	. .	10	405	1	40	1,543	81,568
Wapello	283	12,557	42	1,432	17	948	37	1,629	20	750	11	340	.....	....	8	323	418	17,979

TABLE NO. IV—CONTINUED.

County.	Shorthorn.		Polled Durham.		Hereford.		Angus.		Galloways.		Red Polled.		Jerseys.		Others.		Total	
	Number.	Value.	Number	Value.	Number.	Value.	Number.	Value.	Number.	Value	Number.	Value.	Number.	Value	Number	Value.	Number.	Value.
Warren	961	$ 40,405	237	$ 6,240	107	$ 6,515	90	$ 3,707	26	$ 920	29	$ 1,517	12	$ 361	4	$ 140	1,466	$ 59,805
Washingt'n	357	15,086	442	25,475	35	2,480	243	11,275	123	5,601	13	565	1	35	4	140	1,218	63 747
Wayne ...	1,164	53,343	298	10,630	521	21,029	294	13,680	45	2,690	20	700	5	160	......	....	2,347	102,232
Webster	321	18,320	43	2,761	63	3,301	24	1,350	....	....	37	1,580	6	313	8	600	502	28,225
Winnebago.	101	5,375	7	339	27	1,325	33	2,365	.....	... ..	4	200	9	447	3	200	181	10,251
Winneshiek	725	34,014	60	2,672	19	945	106	4,925	.....	....	27	1,388	6	143	20	1,184	963	45,271
Woodbury.	257	15,781	71	3,935	83	5,320	51	3,940	1	60	29	1,695	52	4,335	1	50	545	35,116
Worth	251	12,135	159	8,435	142	8,409	9	560	1	65	10	455	50	2,500	4	467	626	33,326
Wright. ...	592	20,469	46	2,715	41	2,870	51	3,415	27	965	.....	....	43	370	8	595	808	31,399

GROUP NO. V.

TABLE NO. I.

HORSES—NUMBER AND VALUE.

County.	Colts Under One Year.		Horses One Year and Under Two.		Horses Two Years and Over.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
The State	*116,404*	*$3,911,153*	*148,208*	*$7,451,020*	*974,047*	*$67,918,522*	*1,238,159*	*$79,280,695*
Average Value		*36.60*		*50.27*		*69.72*		*64.08*
Adair	1,449	$ 45,523	1,655	$ 74,982	10,310	$ 655,245	13,414	775,750
Adams	1,276	48,555	1,340	73,423	7,240	480,354	9,856	602,332
Allamakee	1,018	30,818	1,189	62,959	8,187	540,691	10,394	634,468
Appanoose	1,194	39,095	1,423	75,153	7,715	507,674	10,332	621,922
Audubon	1,070	35,785	1,087	52,496	8,815	558,065	10,972	646,346
Benton	1,660	52,006	2,161	103,746	14,751	1,054,216	18,572	1,209,968
Black Hawk	1,183	40,644	1,733	104,221	10,082	789,988	2,998	934,853
Boone	1,167	45,754	1,514	80,511	11,056	818,784	13,737	945,049
Bremer	836	26,382	1,169	52,205	8,306	577,077	10,311	655,664
Buchanan	1,023	29,983	1,535	74,920	9,797	609,310	12,355	714,213
Buena Vista	788	23,694	1,061	49,248	9,733	641,202	11,582	714,144
Butler	1,342	42,832	1,472	78,870	10,509	752,738	13,323	874,440
Calhoun	994	31,706	1,398	68,436	10,140	698,778	12,532	798,920
Carroll	1,169	35,558	1,604	82,201	9,973	683,310	12,746	801,069
Cass	1,387	50,809	1,556	92,626	11,456	856,122	14,399	999,557
Cedar	1,412	45,799	1,712	89,340	11,128	776,716	14,252	911,850
Cerro Gordo	1,048	33,477	1,244	60,844	10,585	700,493	12,877	794,814
Cherokee	1,091	32,687	1,365	73,826	9,403	710,183	11,859	816,696
Chickasaw	1,107	29,199	1,458	63,515	8,049	522,078	10,614	614,792
Clarke	1,108	41,285	1,306	67,396	7,026	513,613	9,440	622,294
Clay	705	18,122	1,097	46,417	8,582	545,615	10,384	610,154
Clayton	1,553	54,068	2,195	117,087	11,472	778,012	15,220	949,167
Clinton	1,497	48,787	3,155	141,924	13,202	823,024	17,854	1,013,735
Crawford	1,195	37,054	1,643	77,038	11,425	766,705	14,263	880,797
Dallas	1,326	45,740	1,743	95,665	11,800	869,255	14,869	1,010,660
Davis	1,238	45,491	1,339	67,211	8,553	629,106	11,130	741,808
Decatur	1,229	40,946	1,508	71,767	8,802	546,940	11,539	659,653
Delaware	1,200	37,628	1,465	70,483	10,520	716,405	13,185	824,516
Des Moines	873	34,861	1,161	71,239	7,522	558,466	9,556	664,566
Dickinson	539	25,308	662	30,954	5,212	306,261	6,413	362,523
Dubuque	1,228	45,031	1,438	76,620	11,777	898,055	14,443	1,020,706
Emmet	534	15,080	629	28,860	5,668	379,186	6,831	423,126
Fayette	1,445	45,404	1,783	88,042	12,340	827,528	15,568	960,974
Floyd	855	27,386	1,106	55,161	8,607	595,801	10,568	678,348
Franklin	1,026	29,845	1,388	57,952	9,110	572,049	11,424	659,846
Fremont	833	26,634	1,091	51,525	7,868	514,952	9,792	593,111
Greene	1,106	38,365	1,589	76,403	10,416	777,648	13,111	892,416
Grundy	956	32,054	1,352	69,774	9,273	610,081	11,581	711,909
Guthrie	1,238	39,558	1,566	73,764	10,924	737,382	13,728	850,704
Hamilton	1,149	34,799	1,364	60,396	11,152	746,719	13,665	841,914
Hancock	812	25,996	1,023	53,890	8,523	584,753	10,358	664,639
Hardin	1,090	30,848	1,522	63,252	10,334	619,498	12,946	713,598
Harrison	916	22,887	1,274	49,596	11,529	658,456	13,719	730,939
Henry	1,277	49,560	1,526	89,163	8,295	616,436	11,098	755,159
Howard	851	26,284	1,148	61,635	6,769	483,422	8,768	571,341
Humboldt	732	26,290	1,015	57,440	7,648	554,409	9,395	638,139
Ida	732	24,249	1,028	57,266	7,605	569,898	9,365	651,413
Iowa	1,623	59,736	2,254	138,746	11,727	792,427	15,604	990,909
Jackson	1,425	50,784	1,733	98,100	9,170	624,597	12,328	773,481
Jasper	1,732	62,357	2,117	109,888	18,464	1,004,171	22,313	1,176,416

TABLE NO. I—CONTINUED.

HORSES—NUMBER AND VALUE.

County.	Colts, Under One Year.		Horses, One Year and under Two.		Horses, Two Years and Over.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Jefferson	1,481	$ 62,190	1,474	$ 87,114	8,412	$ 638,456	11,367	$ 787,760
Johnson	1,473	50,676	1,974	101,968	11,950	861,013	15,397	1,013,675
Jones	1,298	43,867	1,677	85,125	10,059	689,852	13,034	818,844
Keokuk	2,247	84,741	2,102	109,311	13,097	1,040,242	17,446	1,234,294
Kossuth	1,375	38,407	1,797	76,929	14,295	900,066	17,467	1,015,402
Lee	1,390	56,352	1,813	117,098	8,931	703,204	12,134	876,654
Linn	1,556	48,981	2,031	83,950	14,816	913,868	18,403	1,046,799
Louisa	960	40,468	1,076	61,884	7,254	570,465	9,290	672,817
Lucas	913	34,778	1,099	58,513	5,985	446,291	7,997	539,582
Lyon	889	26,255	1,255	56,877	8,724	542,050	10,868	625,182
Madison	1,451	48,951	1,740	96,871	10,132	669,302	13,323	815,124
Mahaska	1,556	57,244	1,877	103,314	10,961	807,077	14,394	967,235
Marion	1,287	47,481	2,019	102,640	10,934	827,623	14.240	977,744
Marshall	1,464	45,283	1,790	76,838	12,309	788,189	15,563	910,310
Mills	876	30,724	1,293	62,099	7,877	552,297	10,046	645,120
Mitchell	765	24,352	941	48,901	7,806	581,007	9,512	654,260
Monona	891	24,373	1,192	49,479	10,075	657,007	12,158	731,859
Monroe	925	34,429	1,125	57,872	6,379	448,507	8,429	540,808
Montgomeay	906	31,335	1,285	65,508	9,483	681,921	11,674	778,764
Muscatine	1,000	33,936	1,142	63,781	8,178	631,938	10,320	729,655
O'Brien	888	28,072	1,191	59,759	9,119	652,897	11,198	740,728
Osceola	630	16,488	765	30,603	6,551	366,886	7,946	413,977
Page	1,546	53,771	2,205	101,882	10,856	709,875	14,607	865,528
Palo Alto	722	19,320	964	40,085	8,757	556,452	10,443	615,857
Plymouth	1,291	39,782	1,703	79,311	13,112	911,525	16,112	1,030,618
Pocahontas	780	23,768	978	44,509	9,520	594,750	11,278	663,027
Polk	1,283	41,746	2,082	98,761	13,128	901,982	16,492	1,042,489
Pottawat'mie	1,576	47,063	2,210	111,566	17,124	1,254,767	20,910	1,413,396
Poweshiek	1,808	60,754	2,081	101,368	11,636	885,741	15,525	1,017,863
Ringgold	1,344	50,885	1,580	79,481	8,271	695,879	11,195	826,245
Sac	1,326	39,084	1,412	64,090	10,725	681,487	13,463	784,661
Scott	759	24,298	1,000	48,987	9,820	699,701	11,579	772,986
Shelby	1,181	36,033	1,308	58,471	11,035	697,238	13,524	791,742
Sioux	1,193	33,796	1,678	76,292	12,776	860,515	15,647	970,603
Story	1,494	51,660	1,675	83,041	12,121	885,362	15,290	1,020,063
Tama	1,942	64,720	2,223	118,615	11,876	851,924	16,041	1,035,259
Taylor	1,513	51,564	1,875	93,572	9,538	593,583	12,926	738,719
Union	1,168	44,633	1,246	62,027	7,856	494,057	10,270	600,717
Van Buren	1,488	65,379	1,585	98,313	8,392	664,380	11,465	828,072
Wapello	1,096	35,966	1,268	56,258	8,138	514,960	10,502	607,184
Warren	1,517	60,511	2,039	103,301	11,776	849,478	15,332	1,013,290
Washington	1,535	60,679	1,966	108,616	11,884	939,940	15,385	1,109,235
Wayne	1,447	52,605	1,619	86,115	9,167	653,100	12,233	791,820
Webster	1,147	32,860	1,617	73,629	11,779	739,646	14,543	846,135
Winnebago	467	13,946	709	35,598	5,684	372,049	6,860	421,593
Winneshiek	1,544	51,859	1,959	100,425	11,170	808,551	14,673	960,835
Woodbury	1,365	41,232	1,730	86,417	13,702	978,761	16,797	1,106,400
Worth	528	13,057	910	41,568	6,401	385,785	17,839	440,410
Wright	880	28,056	1,032	54,112	8,529	612,982	0,441	695,150
Grand total	116.404	$3.911.153	148 208	$7,451,020	974,047	$67.918,522	1,238,659	$79,280.695

GROUP NO. V.—CONTINUED.

TABLE NO. 2—HORSES ELIGIBLE TO REGISTRY.

County.	Clydesdale		Percheron.		Belgian		Coach.		Standard Bred.		Others.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
The State	*677*	*$ 200,915*	*3,167*	*$1,128 681*	*330*	*$ 207,540*	*17*	*$73,215*	*1,427*	*$ 260,435*	*2,394*	*$621,865*	*8,167*	*$2,492,651*
Average Value	...	$ 29,678	.....	$ 35,638	..	$ 62.890		$42,567		$ 18 250	......	$ 25,975	...	$ 30,521
Adair	14	$ 3,550	22	$ 7,555	2	$ 400	3	$ 1,850	10	$ 1.940	61	$ 15,048	112	$ 30,343
Adams	15	4,950	47	26,605	.	....	2	200	1	150	18	10,100	83	42,005
Allamakee	1	200	17	9,735	4	8,100	1	400	3	500	3	1 900	29	20,835
Appanoose	13	3,150	5	4,900	1	300	2	450	4	415	57	13,740	82	22,955
Audubon	12	4,500	35	7 820	3	3,100	1	100	2	350	14	3,225	67	19,095
Benton	1	1,000	15	5,200	34	10,150	5	1,400	2	800	70	12,445	127	30,995
Black Hawk	6	3,250	51	12 200	1	3,000		.	72	7,165	23	4,850	153	30,465
Boone	1	300	12	8,092	18	17,200	....	......	11	3,125	42	11,175	84	39.892
Bremer	2	1,300	4	4,600	2	1,200	...	....	.....	.... .	18	3,600	26	10,700
Buchanan	....	.... .	21	8,750	8	1 200	6	750	9	1,200	14	4,910	58	16,810
Buena Vista	8	3,250	18	6,765	...	.... .	.	.	....	... .	30	3,900	56	13,915
Butler	..	......	2	2 600	2	1,500	..	...	1	125	7	1,950	12	6,175
Calhoun	2	1,000	14	7,850	5	585	2	1,200	4	1,750	52	17,930	79	30,315
Carroll	....	..	4	1,000	2	1,500		.	16	1,100	35	11,380	57	14,980
Cass	13	3,825	39	10,775	2	736	2	1,900	21	4,090	18	7,600	95	28.926
Cedar	9	1,350	65	19,769	1	500	6	6.000	...	.... .	72	12,055	153	39,674
Cerro Gordo	6	2,700	52	17,198	...	.	6	2,950	3	1,925	13	6,100	80	30,873
Cherokee	...	.... .	12	23,950	1	1,700	.	....	8	1,560	25	4,175	46	31,385
Chickasaw	18	4,900	8	6,700	3	3,200	2	130	4	700	16	5,825	51	21,435
Clarke	1	500	41	15,500	2	1,000			1	200	27	5,240	72	22,440

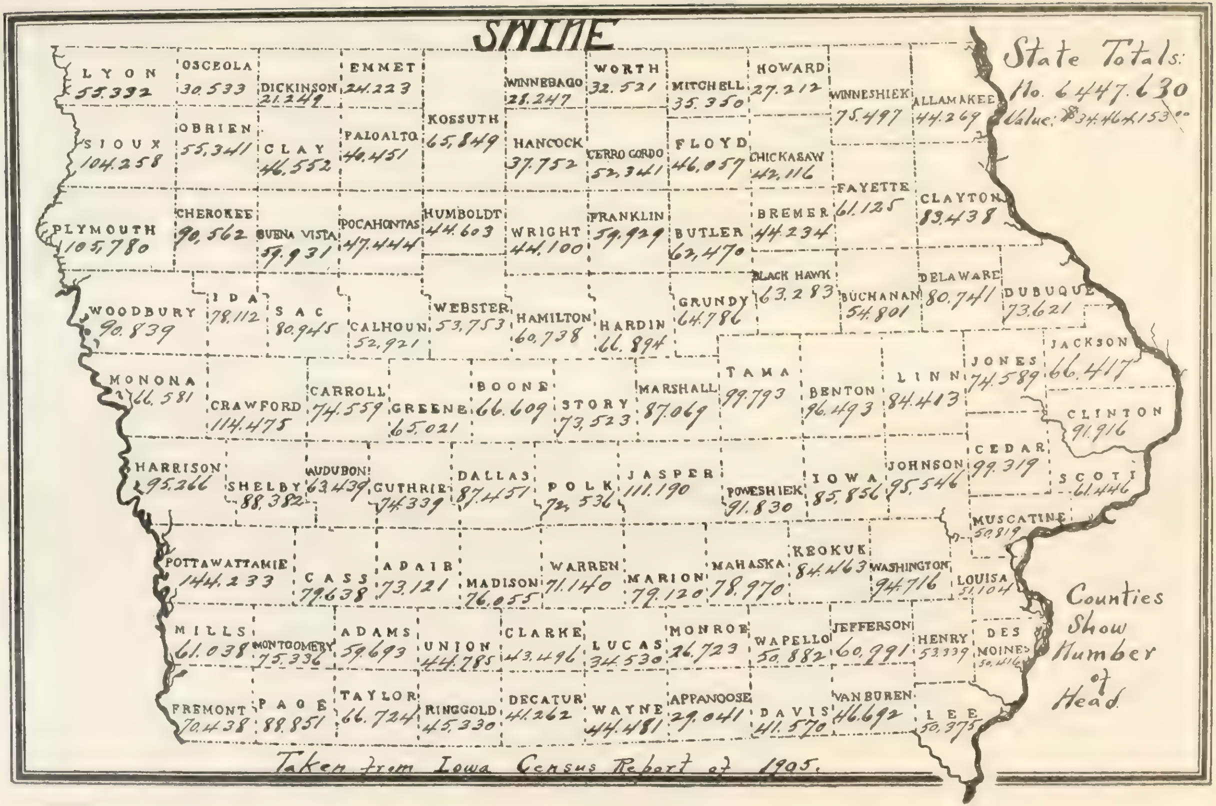
TABLE NO. 2—CONTINUED.

County.	HORSES.													
	Clydesdale		Percheron.		Belgian.		Coach.		Standard Bred.		Others.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Clay	1	$ 100	68	$ 7,200	....	......	....	......	3	$ 350	37	$ 3,520	109	11,170
Clayton	1	1,000	15	6,820	3	3,300	..	.....	......	....	26	7,300	45	18,420
Clinton	....	......	25	6,730	..	......	..	.....	10	1,420	9	5,140	44	13,290
Crawford	....	......	13	10,715	2	4,200	..	..	8	1,380	11	1,905	34	18,200
Dallas	....	..	61	24,275	3	2,150	2	200	16	4,275	17	5,530	99	36,430
Davis	2	210	84	19,480	1	300	1	400	10	1,010	4	1,475	102	22,875
Decatur	1	2,500	6	5,800	8	6,200	2	1,600	9	1,360	25	13,820	51	31,280
Delaware	14	2,995	31	12,000	11	3,800	20	7,000	14	2,650	5	2,460	95	30,905
Des Moines	...	.. ..	31	9,100	.	..	4	800	11	1,875	14	5,000	60	16,775
Dickinson	....	....	14	5,000	3	1,500	1	100	11	1,645	7	1,150	36	9,395
Dubuque	2	2,000	24	5,250	6	10,200	1	170	5	660	14	2,000	52	20,280
Emmet	....	.....	14	6,050	..	......	3	1,300	10	1,290	9	4,450	36	13,090
Fayette	1	300	28	12,050	.	......	3	850	23	4,450	32	7,350	87	25,000
Floyd	1	50	25	6,000		....	2	220	13	1,610	19	4,855	60	12,735
Franklin	2	800	19	6,400	.	......	....	.	3	300	28	5,635	52	13,135
Fremont		......	100	37,550	1	1,000	2	2,700	5	700	20	5,425	128	47,375
Greene	..	.....	20	9,950	5	6,900	...	......	16	2,175	4	4,000	45	23,025
Grundy	17	6,400	9	3,000	..	.....	9	3,890	6	1,100	2	400	43	14,790
Guthrie	3	1,240	17	9,860	3	3,800	6	845	5	1,625	34	7,305	68	24,675
Hamilton	1	100	8	4,000	1	1,800	1	100	6	750	12	3,825	29	10,575
Hancock	11	6,250	11	4,750	2	2,300	1	200	4	2,400	.	.....	29	15,900
Hardin	..	..	38	10,750	2	1,700	2	500	45	5,870	12	3,715	99	22,535
Harrison	2	400	10	7,250	2	1,000	3	6,200	19	5,100	5	4,250	41	24,200
Henry	1	700	3	2,300	...	.	1	100	23	3,175	40	13,365	68	19,640
Howard	18	7,500	3	1,050	22	7,450	.....	......	6	435	8	1,675	57	18,110

Humboldt	1	700	8	3,200	1	1,000			18	2,950	9	825	37	8,675
Ida	7	1,700	12	6,100					15	2,500	6	4,100	40	11,100
Iowa	17	4,600	39	13,100			3	500	21	13,905	12	2,650	92	34,755
Jackson			16	5,100	3	2,900			3	2,200	21	5,260	43	15,760
Jasper	22	4,180	14	6,700					23	2,730	51	13,380	113	26,990
Jefferson	18	8,595	109	25,315	6	4,424	1	100	33	3,830	29	6,225	226	48,519
Johnson	3	550	18	6,300	12	2,750	10	1,100	3	700	53	12,160	99	23,860
Jones	37	9,400	30	10,500			1	2,100	33	6,315	7	2,625	111	30,940
Keokuk	39	11,500	104	28,950	22	7,000	1	825	8	1,125	65	13,835	242	63,285
Kossuth	5	1,300	26	12 102	2	1,700	1	150	25	3,050	2	1,475	61	19,777
Lee	7	1,950	27	8,000	3	1,400	2	3,800	73	15,300	88	56,490	200	86,940
Linn	2	600	12	6,850	13	31,900	1	150	6	1,000	32	9,301	96	49,801
Louisa	2	1,700	73	23 400					8	2,750	23	5,300	106	33,150
Lucas	10	1,500	15	3,350					4	366	17	3,905	46	9,121
Lyons	2	2,000	161	25,350	3	145	8	1,650	16	2,325	21	1,400	211	32,870
Madison			23	11,635	1	1,000	1	200	11	2,300	60	22,122	99	37,557
Mahaska	29	8,100	125	32,025	5	900	5	4,400	31	8,775	18	4,110	216	58,310
Marion	19	6,530	37	13,780	2	3,200			26	1,132	11	6,750	125	31,692
Marshall	22	5,400	36	12,380	1	500			10	1,260	7	1,260	76	20,800
Mills			11	7,630	1	400			19	2,845	1	500	35	11,375
Mitchell	13	1,760	21	5,550	1	1,000	1	500	10	1,300	9	3,050	58	13,160
Monona	5	800	30	13,700					12	1,325	18	4,100	65	19 925
Monroe	10	2,600	6	1,000	1	500	2	400	2	150	11	5,700	65	10,350
Montgomery	2	500	11	5,300					2	1,025	23	8 225	38	15,050
Muscatine			11	5,000					11	1,040	51	8,290	73	14,330
O'Brien	3	1,300	18	1,800					10	2,690	18	1,150	49	13,240
Osceola			5	4,300	3	900	3	1,650	7	2 250	24	3,100	42	12,200
Page			25	26,170	1	200	6	750	29	6,600	73	21,500	134	55,220
Palo Alto			11	4,550					12	1,120	2	250	25	5,920
Plymouth	1	150	8	5,900	1	100	4	660	24	3,845	9	2,380	47	13,335
Pocahontas			10	11,800	1	2,000			2	150	16	8,340	89	25,290
Polk	1	150	29	15,340	1	1,600	1	50	50	7,600	16	8 420	128	33,160
Pottawattamie	3	600	29	17,850	1	2,000	3	925	53	13,350	6	530	95	35,255
Poweshiek	6	1,500	9	4 300	1	2 700			12	1,617	6	1,250	37	11,397
Ringgold	1	800	38	12,550					7	860	83	15,085	129	29,295
Sac	55	11,325	11	6,600	2	1,200			2	150	20	4 280	90	28 855
Scott			2	1,800			1	800	3	100	11	2,300	17	5,300
Shelby	5	800	21	8,125	2	2,150	2	1,500	6	1,775	19	3,280	55	16,630
Sioux	6	2,850	17	7,500	1	3,300			61	12,050	2	225	90	25,925
Story	3	800	105	31,375			1	200	25	3,510	16	4,155	150	40,310

TABLE NO. 2—CONTINUED.

County.	HORSES.													
	Clydesdale.		Percheron.		Belgian.		Coach.		Standard Bred.		Others.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Tama	22	$ 7,700	50	$ 20,020	4	$ 2,500	1	$ 150	17	$ 2,800	11	$ 1 814	105	$ 34,984
Taylor	13	3,850	55	19,730	5	1,950		..	17	4,050	13	6,550	103	36,130
Union	1	150	108	29,915	1	150	1	100	33	3,330	52	11,035	196	44,680
Van Buren	35	8,680	109	37,080	6	2,300	1	2,000	6	2,200	4	200	161	52,460
Wapello	3	500	29	4,850	....	....	...	....	23	2,710	2	275	57	8,335
Warren	....	....	116	28,360	..	....	....	....	33	4,070	57	12,280	209	44,710
Washington	9	5,500	52	23,800	...	.....	....	...	53	11,295	12	4,375	126	44,970
Wayne	....	....	26	19,965	1	1,800	1	150	14	2,110	67	13,460	109	37,485
Webster	...	.	23	9,670	2	1,200	...	....	8	900	22	3,205	55	14,975
Winnebago	1	1,500	8	4,050	....	....	....	....	.....	......	20	2,685	29	8,235
Winneshiek	..	....	30	9,660	17	5,100	1	300	....	......	19	3,125	67	18,185
Woodbury	4	2,600	19	8,200	..	... ...	1	3,600	28	8,725	8	3,500	60	26,625
Worth	...	......	12	5,880	2	400	....	......	3	800	2	1,100	19	8,180
Wright	3	1,575	20	8,000	2	2,200	.	...	1	250	4	2,050	30	14,075



SWINE

State Totals:
No. 6447.630
Value: $34.464.153.00

Counties Show Number of Head.

Taken from Iowa Census Report of 1905.

LYON 55.332
OSCEOLA 30.533
DICKINSON 21.249
EMMET 24.223
WINNEBAGO 28.247
WORTH 32.521
MITCHELL 35.350
HOWARD 27.212
WINNESHIEK 75.497
ALLAMAKEE 44.269
SIOUX 104.258
OBRIEN 55,341
CLAY 46.552
PALOALTO 40.451
KOSSUTH 65,849
HANCOCK 37.752
CERRO GORDO 52,341
FLOYD 46,057
CHICKASAW 42.116
FAYETTE 61.125
CLAYTON 83.438
PLYMOUTH 105,780
CHEROKEE 90,562
BUENA VISTA 59.931
POCAHONTAS 47.444
HUMBOLDT 44.603
WRIGHT 44,100
FRANKLIN 59.929
BUTLER 62,470
BREMER 44.234
BLACK HAWK 63.283
BUCHANAN 54.801
DELAWARE 80.741
DUBUQUE 73.621
WOODBURY 90.839
IDA 78.112
SAC 80.945
CALHOUN 52.921
WEBSTER 53,753
HAMILTON 60.738
HARDIN 66.894
GRUNDY 64.786
TAMA 99.793
BENTON 96.493
LINN 84.413
JONES 74.589
JACKSON 66.417
CLINTON 91.916
MONONA 66.581
CRAWFORD 114.475
CARROLL 74.559
GREENE 65.021
BOONE 66.609
STORY 73,523
MARSHALL 87.069
HARRISON 95.266
SHELBY 88,382
AUDUBON 63439
GUTHRIE 74339
DALLAS 87.451
POLK 72, 536
JASPER 111.190
POWESHIEK 91.830
IOWA 85,856
JOHNSON 95.546
CEDAR 99.319
SCOTT 61.446
MUSCATINE 50.819
POTTAWATTAMIE 144.233
CASS 79.638
ADAIR 73.121
MADISON 76.055
WARREN 71.140
MARION 79.120
MAHASKA 78.970
KEOKUK 84.463
WASHINGTON 94.716
LOUISA 51.104
MILLS 61.038
MONTGOMERY 75.336
ADAMS 59.693
UNION 44.785
CLARKE 43.496
LUCAS 34.530
MONROE 26.723
WAPELLO 50.882
JEFFERSON 60.991
HENRY 53.339
DES MOINES 50.416
FREMONT 70.438
PAGE 88.851
TAYLOR 66.724
RINGGOLD 45.330
DECATUR 41.262
WAYNE 44.481
APPANOOSE 29.041
DAVIS 41.570
VAN BUREN 46.692
LEE 50,375

GROUP NO. VI.

TABLE NO. I.—SWINE.

County.	Total.		Eligible to Registry.													
	Number and Value by Counties.		Poland China.		Duroc Jersey.		Berkshire.		Chester White.		Yorkshire.		Others.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Total for State	*6,447,630*	*$ 34,464,153*	*58,512*	*$771,589*	*33,539*	*$421,366*	*2,547*	*$ 35,116*	*11,101*	*$139,633*	*543*	*$5,642*	*3,793*	*$45,771*	*110,035*	*$1,419,107*
Average value		*5.35*		*13.18*		*12.56*		*13.70*		*12.57*		*10.37*		*12.06*		*12.89*
Adair	73,121	352,546	734	$ 10,598	973	$ 9,365	21	$ 280	201	$ 2,544	......	....	73	$ 1,063	2,002	$ 23,850
Adams	59,663	290,391	441	5,591	706	7,735	4	74	231	2,408	.....	... ..	3	41	1,385	15,849
Allamakee	44,269	244,675	249	3,404	89	723	10	200	316	2,956		....	......	....	664	7,283
Appanoose	29,041	142,511	284	3,174	99	799	6	105	114	1,044	21	$ 170	83	454	607	5,746
Audubon	63,429	392,782	608	8,794	455	7,365	8	120	18	285	.....	....	1	10	1,090	16,574
Benton	96,493	474,899	387	3,489	228	2,618	5	100	67	706	.....	......	198	1,960	885	8,873
Black Hawk	63,283	330,612	733	8,848	214	3,109	31	335	58	970	...	....	2	30	1,038	13,292
Boone	66,609	367,199	279	4,733	619	8,854	41	500	157	1,513		....	2	28	1,098	15,628
Bremer	44,234	230,422	229	2,569	32	460	1	10	62	1,025	80	1,000	33	496	437	5,560
Buchanan	24,801	277,980	412	4,613	174	2,588	.....	....	80	1,026	.....	....	62	402	728	8,629
Buena Vista	59,931	314,730	634	7,182	72	970	......	....	24	474	2	40	78	812	810	9,478
Butler	62,470	331,352	712	9,713	273	2,841	1	25	57	1,070	50	500	3	39	1,096	14,188
Calhoun	52,921	309,310	1,504	19,267	727	9,956	25	480	233	3,201	......	.. ...	...	..	2,489	32,904
Carroll	74,559	369,075	258	3,533	471	6,221	.....	....	67	611	.....	....		.. ..	796	10,365
Cass	79,638	463,625	995	15,323	277	3,750	8	160	161	2,310	...	....	77	530	1,524	22,073
Cedar	99,319	566,877	1,098	11,911	179	2,799	3	30	159	1,857	1	12	19	385	1,459	16,994
Cerro Gordo	22,341	294,693	175	2,636	224	3,203	1	14	78	593	.....	....	.....	.....	478	6,446
Cherokee	90,562	525,099	430	6,395	919	11,365	72	445	219	2,944	....	.....	...	....	1,640	21,149
Chickasaw	42,116	181,943	274	2,970	12	129	101	760	99	786		... ...	4	60	490	4,705
Clarke	43,496	211,494	549	7,715	100	992	76	885	32	378	......	....	9	210	766	10,180

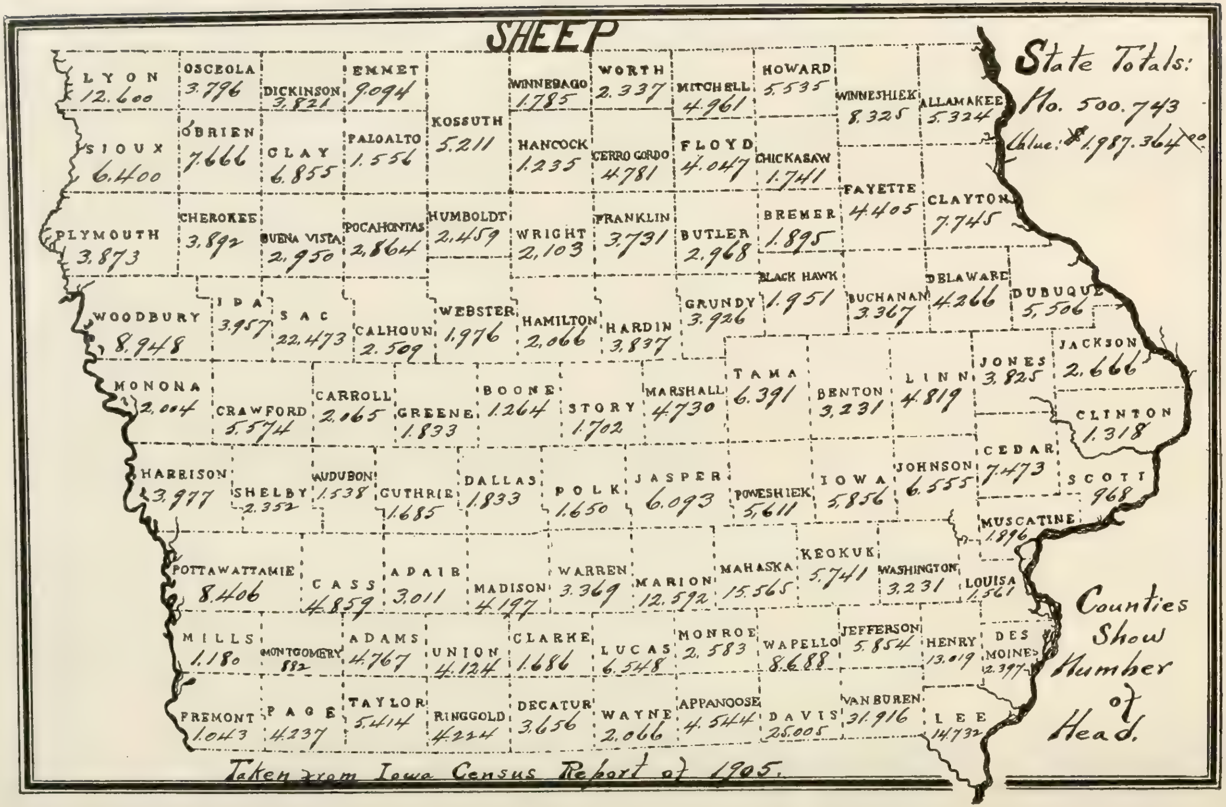
Clay	46,552	$ 236,755	675	$ 3,606	656	$ 6,182	.....	$.......	136	$ 1,669	...	$.......	90	$ 1,050	1,557	$ 12,507
Clayton	83,428	484,954	734	8,239	162	2,323	7	110	36	331	.....	... ...	3	39	942	11,042
Clinton	91,916	483,790	123	1,600	122	1,032	.....	....	56	738	.....	....	.....	....	301	3,370
Crawford	114,475	591,391	369	5,312	424	4,290	38	425	21	349	..	. ....	76	533	928	10,909
Dallas	87,451	500,136	1,202	15,962	655	5,683	26	456	51	474	....	....	49	540	1,983	23,115
Davis	41,570	203,305	254	2,962	312	2,554	10	148	171	1,536	7	100	.....	.	754	7,300
Decatur	41,262	215,636	566	8,974	313	2,583	100	1,000	107	926	74	560	4	99	1,164	14,142
Delaware	80,741	431,465	427	5,606	97	1,375	4	90	106	1,190	.....	....	......	.....	634	8,261
Des Moines	50,416	285,881	427	17,714	194	2,405	2	25	64	721	.....	....	36	500	723	21,365
Dickinson	21,249	117,691	158	1,889	163	2,370	1	15	19	285	..	....	14	213	355	4,772
Dubuque	73,621	434,775	630	5,412	109	1,242	83	695	35	700	.....	....	.....	....	857	8,049
Emmet	24,223	120,960	224	2,955	104	918	.....	.....	12	243	...	...	1	25	341	4,141
Fayette	61,125	300,352	717	9,981	135	1,229	......	....	51	675	....	....	.....	....	903	11,885
Floyd	46,057	237,060	185	2,640	80	1,415	...	....	13	280	.....	.... .	7	130	285	4,465
Franklin	59,929	331,684	676	8,448	15	180	1	20	239	863	....	.. .	1	30	932	9,541
Fremont	70,438	353,411	486	6,743	196	4,182	9	160	9	125	.....	.....	4	60	704	11,270
Greene	65,021	365,224	755	10,493	313	3,942	7	105	156	1,872	....	....	.....	....	1,231	16,412
Grundy	64,786	324,905	508	8,114	117	2,034	48	350	86	1,181	.....	...		.. ..	759	11,679
Guthrie	74,329	416,874	734	9,297	427	6,867	134	1,616	48	537	1	20	56	268	1,400	18,605
Hamilton	60,738	313,273	479	5,749	194	2,742	72	635	77	770	.....	....	52	803	874	10,699
Hancock	37,752	232,304	621	8,156	326	3,782	29	310	24	362	.....	....	4	70	1,004	12,680
Hardin	66,894	362,630	597	8,320	637	8,239	5	100	60	886	......	....	10	100	1,309	17 645
Harrison	95,266	421,770	875	10,632	397	6,029	42	794	65	1,111	3	75		......	1,381	18,641
Henry	53,339	303,647	267	3,124	737	5,329	10	120	59	760	.	... ...	238	1,895	1,311	11,228
Howard	27,212	150,348	187	1,879	39	627	.....	....	158	2,005	......	.....	1	10	385	4,521
Humboldt	44,603	251,896	215	2,606	188	2,709		.... ..	194	2,535	......	....	39	400	636	8,250
Ida	78,112	449,171	741	11,941	591	11,041	358	5,190	100	1,555	1	15	.....	... .	1,791	29,732
Iowa	85,856	471,228	746	11,875	277	3,369	11	220	177	3,477	.....	....		....	1,211	18,941
Jackson	66,447	418,864	1,442	21,906	178	1,777	6	150	2	25	.....	...	75	510	1,703	24,368
Jasper	111,190	585,023	673	8,483	925	13,039	63	670	232	3,141	...	......	....	....	1,893	25,333
Jefferson	60,991	348,613	586	8,561	617	4,693	6	65	94	1,205	8	130	1	12	1,312	14,666
Johnson	95,546	523,668	731	7,930	126	2,011	2	33	142	1,417	.....	... ...	30	428	1,031	11,819
Jones	74,589	408,757	328	4.086	311	2,889	30	400	48	775		... ...	10	105	727	8,255
Keokuk	84,463	488,042	1,277	15,045	974	10,680	6	130	305	4,950	12	109	24	360	2,598	31,274
Kossuth	65,849	344,274	449	5,964	466	5,353	7	105	46	823	.....	... ..	.....	....	968	12,245
Lee	50,375	299,901	485	7,272	249	2,827	1	25	119	1,618	....	... ...	5	1,065	809	12,807
Linn	84,413	413,710	1,090	11,933	551	4,801	106	965	187	2,372	22	224	.....	....	1,856	20,295
Louisa	51,104	310,410	520	10,107	121	1,645	1	20	81	1,472	....	....	63	825	786	14,069
Lucas	34,530	191,870	718	7,452	449	4,746	.....	....	149	1,400	....	....	.....	....	1,316	13,598
Lyon	55,332	296,530	870	10,112	303	3,409	30	300	139	1,917	.....	....	79	241	1,421	15,979

TABLE NO. I—CONTINUED.

SWINE.

County.	Total.		Eligible to registry.													
	Number and Value by Counties.		Poland China.		Duroc Jersey.		Berkshire.		Chester White		Yorkshire.		Others.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Madison	76,055	425,536	465	4,871	331	3,135	21	310	251	2,778	....	....	8	60	1,076	11,154
Mahaska	78,970	429,155	426	6,553	335	4,984	72	2,004	270	2,917	2	40	....	......	1,105	16,498
Marion	70,120	412,589	575	6,040	179	1,917	3	46	19	264	.....	......	64	674	840	8,941
Marshall	87,069	478,965	638	8,483	229	3,360	31	1,925	587	6,704	8	200	204	2,057	1,697	22,730
Mills	61,038	329,782	747	11,828	284	3,813	.....	...	120	1,565	....	.....	3	50	1,154	17,256
Mitchell	35,350	201,280	350	3,581	158	1,797	...	.. ..	1	321	2	30	13	155	524	5,884
Monona	66,581	350,142	371	5,131	278	3,307	1	12	23	305	.....	....	8	105	681	8,860
Monroe	26,723	151,693	349	3,798	129	1,965	5	75	43	447	.....	....	......	....	526	6,285
Montgomery	75,336	396,629	627	11,242	472	5,883	4	79	24	490		....		....	1,127	17,694
Muscatine	50,819	279,237	283	3,477	104	1,571	....	...	146	1,466	.....	.. ..		....	533	6,514
O'Brien	55,341	306,469	657	9,492	543	11,316	2	45	186	2,763	....	.. .	35	151	1,423	23,767
Osceola	30,533	138,662	46	753	73	1,102	....	.....	36	582	11	162	31	312	197	2,911
Page	88,851	471,026	658	7,952	496	5,673	20	390	88	1,002	.	.. ...	10	202	1,272	15,219
Palo Alto	40,451	191,161	155	2,075	79	1,041	...	....	97	1,168	.....		---	....	331	4,284
Plymouth	105,980	615,717	1,136	18,369	245	4,284	25	530	78	1,445		...	37	431	1,521	25,059
Pocahontas	47,444	249,996	571	8,093	112	1,395	6	60	74	945	...		44	406	807	10,899
Polk	72,536	360,454	837	9,927	704	11,402	34	635	57	946	8	112	58	1,276	1,698	24,298
Pottawattamie	144,233	824,225	2,155	27,060	1,005	14,615	4	95	79	1,290		...	44	525	3,287	43,585
Poweshiek	91,830	520,066	757	9,128	510	7,197		..	170	2,727	...	..	...	....	1,437	19,052
Ringgold	45,330	209,245	859	8,438	540	7,143	3	33	98	1,104	....	..	30	1,419	1,530	18,137
Sac	80,945	395,751	786	11,404	715	6,644	62	924	117	1,606	.....	. .	1	20	1,681	20,598
Scott	61,446	378,375	278	4,190	256	3,099			18	365		.		....	552	7,654
Shelby	88,382	509,107	975	13,347	1,109	14,320	163	2,489	174	2,145	39	906	19	280	2,479	33,487
Sioux	104,258	6,116,816	477	6,829	284	5,106		....	29	565	.....	......	....	....	790	12,495
Story	73,523	423,397	558	7,205	449	7,603	63	555	474	5,883	....	....	36	329	1,580	21,585

Tama	99,703	538,922	888	12,506	418	5,144	48	630	113	1,410	.....	....	144	1,951	1,611	21,641
Taylor	66,724	312,162	1,064	12,635	336	3,222	20	300	149	1,862	.....	....	.	... ...	1,569	18,019
Union	44,785	218,139	438	3,801	628	7,989	62	820	73	1,369	.....	....	1,201	15,987	2,402	29,966
Van Buren	44,692	263,039	828	8,636	368	3,683	60	510	433	5,046	7	73	......	... ...	1,696	17,958
Wapello	50,882	216,838	300	3,880	187	2,038	22	610	57	837	108	667	...	....	674	8,032
Warren	71,140	$ 364,599	868	$ 9,571	217	$ 2,460	40	$ 570	122	$ 1,260	7	$ 40	2	$ 25	1,256	$ 13,926
Washington	94,716	561,070	750	9,983	334	3,578	36	561	122	1,527	.....	....	9	175	1,251	15,824
Wayne	44,481	213,798	630	6,902	206	2,450	29	280	117	1,474	57	350	..	....	1,039	11,456
Webster	53,753	266,850	434	8,112	121	1,675	6	80	4	75	.....	.....	26	440	591	10,382
Winnebago	28,247	140,463	167	1,851	66	660	.....	...	66	627	5	75		....	304	3,213
Winneshiek	75,497	351,123	424	4,542	179	1,347	.....	... ...	24	386	...	....	8	65	635	6,340
Woodbury	90,839	516,412	844	11,678	668	10,796	35	568	176	2,508	7	22	71	1,070	1,801	26,642
Worth	32,521	181,378	107	1,004	56	457	1	10	21	305	.....	....	19	190	204	1,966
Wright	44,100	235,018	353	5,683	143	1,815	....	....	52	1,182	....	... .	49	585	597	9,265


SHEEP
LYON 12.600
OSCEOLA 3.796
DICKINSON 3.821
EMMET 9.094
KOSSUTH 5.211
WINNEBAGO 1.785
WORTH 2.337
MITCHELL 4.961
HOWARD 5.535
WINNESHIEK 8.325
ALLAMAKEE 5.324
SIOUX 6.400
OBRIEN 7.666
CLAY 6.855
PALOALTO 1.556
HANCOCK 1.235
CERRO GORDO 4781
FLOYD 4.047
CHICKASAW 1.741
FAYETTE 4.405
CLAYTON 7.745
PLYMOUTH 3,873
CHEROKEE 3.892
BUENA VISTA 2,950
POCAHONTAS 2,864
HUMBOLDT 2,459
WRIGHT 2,103
FRANKLIN 3.731
BUTLER 2,968
BREMER 1.895
BLACK HAWK 1.951
BUCHANAN 3.367
DELAWARE 4.266
DUBUQUE 5,506
WOODBURY 8.948
IDA 3.957
SAC 22.473
CALHOUN 2.509
WEBSTER 1.976
HAMILTON 2,066
HARDIN 3,837
GRUNDY 3.926
JONES 3,825
JACKSON 2,666
MONONA 2.004
CRAWFORD 5.574
CARROLL 2.065
GREENE 1.833
BOONE 1.264
STORY 1.702
MARSHALL 4.730
TAMA 6.391
BENTON 3,231
LINN 4.819
CLINTON 1.318
HARRISON 3.977
SHELBY 2.352
AUDUBON 1.538
GUTHRIE 1.685
DALLAS 1.833
POLK 1.650
JASPER 6.093
POWESHIEK 5,611
IOWA 5,856
JOHNSON 6.555
CEDAR 7.473
SCOTT 968
MUSCATINE 1.896
POTTAWATTAMIE 8.406
CASS 4.859
ADAIR 3.011
MADISON 4.197
WARREN 3.369
MARION 12.592
MAHASKA 15.565
KEOKUK 5.741
WASHINGTON 3.231
LOUISA 1.561
MILLS 1.180
MONTGOMERY 882
ADAMS 4.767
UNION 4.124
CLARKE 1.686
LUCAS 6,548
MONROE 2,583
WAPELLO 8.688
JEFFERSON 5.854
HENRY 13.019
DES MOINES 2.397
FREMONT 1.043
PAGE 4.237
TAYLOR 5.414
RINGGOLD 4.224
DECATUR 3.656
WAYNE 2,066
APPANOOSE 4.544
DAVIS 25.005
VAN BUREN 31.916
LEE 14.732

State Totals:
No. 500.743
Value: $1.987.364.00

Counties Show Number of Head.

Taken from Iowa Census Report of 1905.

GROUP NO. VII.

TABLE NO. I.—SHEEP.

County.	Number and Value.								Eligible to Registry.							
	Lambs Under One Year.		Ewes.		Rams and Wethers.		Total.		Shropshire.		Other Coa'se Wool Sheep.		Fine Wools.		Total	
	Number.	Value.	Number.	Value,	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Total for State.	*142,188*	*$458 075*	*319,507*	*$1,359,541*	*39,048*	*$169,748*	*500,743*	*$1,987,364*	*6,793*	*$ 60 721*	*1,359*	*$ 10,622*	*1.836*	*$ 15,009*	*9,988*	*$86 352*
Average Value	.....	*3 22*	.....	*4.25*	.....	*4.34*	.	*3.96*		*8 93*		*7.73*		*8.17*		*8 64*
Adair	546	$ 1,616	2,246	$ 8,718	219	$ 924	3,011	$ 11,258	61	$ 342	..	......	..	$ ..	61	$ 342
Adams	1,240	3,734	3,352	13,526	175	1,172	4,767	18,432	15	135	.	...		....	15	135
Allamakee	1,028	3,202	4,117	14,246	179	879	5,324	18,327	78	602	28	$ 357	.....	...	106	959
Appanoose	976	2,671	2,551	7,542	1,017	2,579	4,544	12,792	67	230	35	184	1	10	103	424
Audubon	311	1,540	1,160	7,197	67	567	1,538	9,304	67	900		.. ..	10	100	77	1.000
Benton	270	995	2,768	9,455	193	706	3,231	11 156	6	95	20	120	.....	.....	26	215
Black Hawk	341	1,352	1,490	6,385	120	543	1,951	8,280	13	80	..	....	1	16	14	96
Boone	257	951	974	4,467	33	380	1,264	5,798	234	1,500	..	....	...	.....	234	1,500
Bremer	387	1,176	1,409	5,094	99	368	1,895	6,638	7	70	..	......	1	30	8	100
Buchanan	679	2,029	2,503	9,789	185	822	3,367	12,640	5	70		.....	.... .	......	5	70
Buena Vista	716	2,482	2,185	7,617	49	313	2,950	10,412	41	355	. .	.....	.....	....	41	355
Butler	479	1,863	2,289	9,368	200	1 048	2,968	12,279	19	192	8	80	......	......	27	272
Calhoun	348	1,308	2,076	8,144	85	412	2,509	9,864	25	180	.. ..	....	.....	....	25	180
Carroll	517	2,298	1,270	5,243	278	1,116	2,065	8,657	12	100	.	....	....	....	12	100
Cass	1,456	5,308	2,798	15,070	425	2,885	4,859	23,353	142	2,080	...	....	27	208	169	2,288
Cedar	523	2,145	5,744	26,719	1,206	4,722	7,473	33,586	225	2,104	.....	......	8	155	233	2,259
Cerro Gordo	1,771	5,126	2,893	12,129	117	752	4,781	18,007	45	390	4	40	....	... ...	49	430
Cherokee	860	4,844	2,760	12,523	272	883	3,892	18,250	15	215	......	....	.....	... ...	15	215
Chickasaw	336	1,028	1,271	4,494	134	547	1,741	6,069	20	160	....	....	.	......	20	160
Clarke	373	1,305	1,247	4,734	66	509	1,686	6,548	3	30	....	....	17	300	20	330

TABLE NO. I—CONTINUED.

SHEEP.

County.	Number and Value.								Eligible to Registry.							
	Lambs Under One Year.		Ewes.		Rams and Wethers.		Total.		Shropshire.		Other Coa'se Wool Sheep.		Fine Wools		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Clay	2,092	$ 6,151	4,348	$ 16,388	415	$ 1,765	855	$ 24,304	70	$ 579	123	$ 600	1	$ 12	194	$ 1,191
Clayton	1,725	4,894	5,762	21,881	258	1,346	7,745	28,121	95	560	....	....	13	165	108	725
Clinton	119	397	1,187	4,925	12	65	1,318	5,387	1	25	1	25	10	100	12	150
Crawford	1,957	7,533	3,290	11,415	327	1,384	5,574	20,332	2	21	....	...	.....	......	2	21
Dallas	421	1,508	1,330	5,154	82	442	1,833	7,104	9	70	4	80	21	180	34	330
Davis	7,595	20,850	15,586	55,672	1,824	7,178	25,005	83,700	54	527	269	1,490	22	225	345	2,242
Decatur	572	2,571	2,615	10,597	469	2,481	3,656	15,649	26	355	11	60	.....	....	37	415
Delaware	699	2,616	3,374	15,163	193	1,190	4,266	18,969	57	480	9	150		...	66	630
Des Moines	1,088	2,836	996	2,983	313	921	2,397	6,740		...	....	....	3	30	3	30
Dickinson	1,384	3,821	2,131	8,822	306	1,789	3,821	14,432	51	955	1	30	.....	......	52	985
Dubuque	974	2,969	4,020	16,352	512	2,174	5,506	21,495	35	210	2	30	1	30	38	270
Emmet	1,043	3,031	7,232	25,322	819	2,006	9,094	30,359	85	1,425	....	....		....	85	1,425
Fayette	1,087	3,323	3,180	12,608	138	780	4,405	16,711	11	147	10	50	23	135	44	332
Floyd	932	2,974	2,839	10,883	276	1,016	4,047	14,873	8	842	1	20	.....		9	862
Franklin	2,090	5,188	1,334	4,720	307	1,261	3,731	11,169	45	475	...	....	....	....	45	475
Fremont	368	1,491	615	2,209	60	179	1,043	3,879	41	223	3	12		.....	44	235
Greene	446	1,632	1,327	5,335	60	319	1,833	7,286	31	325	....	......	...	....	31	325
Grundy	1,982	4,563	1,690	7,635	254	1,285	3,926	13,433	20	245	3	55	2	35	25	335
Guthrie	348	1,148	1,143	4,043	194	877	1,685	6,068	13	136	1	15	....	......	14	151
Hamilton	340	1,193	1,686	6,792	40	202	2,066	8,187	9	80	....	... ...	....	.. ...	9	80
Hancock	280	1,068	874	3,471	81	418	1,235	4,957	4	77	......	... ..		.....	4	77
Hardin	287	821	2,958	10,532	592	3,116	3,837	14,469	62	530	......	...	101	1,020	163	1,550
Harrison	2,108	4,811	1,573	5,358	296	1,162	3,977	11,331	8	120	1	15		...	9	135
Henry	2,383	7,659	9,710	37,873	926	4,971	13,019	50,503	331	2,985	84	455	6	35	421	3,475
Howard	857	2,806	4,531	16,094	147	803	5,535	19,703	113	858	1	15	.....	....	114	873
Humboldt	561	2,267	1,825	8,041	73	517	2,459	10,825	86	800	....	....	7	150	93	
Ida	2,223	8,326	1,549	6,638	185	1,410	3,957	16,374	52	550	..	...	..	....	52	
Iowa	1,544	3,928	4,169	16,689	143	1,112	5,856	21,729	30	317	56	600	10	200	96	
Jackson	296	1,076	2,089	7,838	281	1,165	2,666	10,079		....	20	56		....	20	
Jasper	1,395	5,469	4,356	17,359	342	1,512	6,093	24,340	142	783	....	.... ..	.	....	142	

Jefferson	1,768	4,985	3,480	13,747	606	2,646	5,854	21,348	136	1,035	50	200	12	88	198	1,323
Johnson	1,299	5,252	4,308	17,697	948	6,472	6,555	29,421	5	66	...	...	4	98	9	164
Jones	795	2,732	2,506	8,914	524	2,975	3,825	14,621	7	81	..	...	......	...	7	81
Keokuk	1,885	5,382	3,654	11,498	202	928	5,741	17,803	17	120	....	....	20	210	37	330
Kossuth	1,609	5,644	2,634	10,866	968	4,565	5,211	21,075	10	160	....	.	....	....	10	160
Lee	3,830	11,136	10,551	40,753	345	2,137	14,732	57,026	743	6,635	133	710	8	90	884	7,435
Linn	856	2,813	3,789	140 895	174	1,253	4,819	144,961	166	2,105		.	..	. .	166	2,105
Louisa	256	881	1,245	5,290	60	317	1,561	6 488	33	203	...	.... .		..	33	203
Lucas	1,736	6,600	4,589	19,457	223	1,115	6,548	27,172	84	615	19	370	19	375	122	1,360
Lyon	10,431	35,114	2,059	8,874	110	691	12,600	44,679	25	272				. .	25	272
Madison	1,068	4,846	2,849	10,620	280	1,379	4,179	16,845	108	1,648	84	427	1	10	193	2,080
Mahaska	3,985	11,818	10,458	36,348	1,122	3,864	15,565	52,030	188	1,100	...	----	165	825	353	1,925
Marion	7,984	21,029	4,430	16,282	178	934	12,592	38,245	155	1,226	2	10	2	20	159	1,256
Marshall	1,505	4,055	2,776	12,135	449	1,780	4,730	17,970	59	639	9	95	3	25	71	759
Mills	339	1,078	756	3,087	85	330	1,180	4,495	....	.	1	30	....	. .	1	30
Mitchell	951	3,909	3,860	15,089	150	956	4,961	19,954	136	1,235	....	... .	2	60	138	1,295
Monona	663	1,403	765	2,452	576	3,103	2,004	6,958	1	15		... ...		..	1	15
Monroe	625	2,669	1,808	7,954	150	1,189	2,583	11,812	177	1,565	... ..	...	...	...	177	1,565
Montgomery	228	930	629	3,213	25	317	882	4,460	2	38	...	..	6	150	8	188
Muscatine	459	1,758	1,260	6,104	197	663	1,896	8,525	173	1,075	8	70	.....	..	181	1,145
O'Brien	2,202	8,220	5,279	22,732	185	1,031	7,666	31,983	278	2,002	2	40	......	...	280	2,042
Osceola	1,039	3,355	2,565	10,340	192	875	3,796	14,570	16	221	..	...	.....	....	16	221
Page	779	3,065	2 874	10,674	584	3,198	4,237	16,937	37	370	2	30	...	...	39	400
Palo Alto	361	1,107	1,154	4,631	41	194	1,556	5,932	15	52	....	..	...		15	52
Plymouth	1,868	6 760	1,928	9,299	77	388	3,873	16,147	3	17	.. ...	.	....	.. ..	3	17
Pocahontas	1,192	4,378	1,494	6,476	178	769	2,864	11,623	15	176	7	51	.....	......	22	227
Polk	293	1,028	1,304	5,583	53	674	1,650	7,285	16	218	100	1,500		. ....	116	1,718
Pottawattamie	1,644	6,900	4,780	13,083	1,982	620	8,403	20,603	401	3,330	11	110	....	..	412	3,440
Poweshiek	981	4,117	4,285	19,137	342	2,257	5,611	25,511	39	291	1	10	500	4,350	540	4,651
Ringgold	769	2,315	3,140	11,327	315	1,790	4,221	15,432	99	892	110	1,153	1	10	110	2,055
Sac	4,959	15,388	10,784	39,443	6,730	26,257	22,473	81,088	111	1,145	.. ..	... .	...	.	111	1,145
Scott	62	247	876	4,526	30	181	968	4,954	1	20	..	.	.....	...	1	20
Shelby	1,032	4,880	1,110	4,428	219	1,516	2,352	10,824	...	..	...	...	....	....	.	.
Sioux	1,217	3,406	4,703	14,242	480	1,837	6,400	19,485	4	28	8	40	...	.... ..	12	68
Story	346	1,242	1,261	5,538	95	445	1,702	7,225	28	143	...	....		....	28	143
Tama	1,630	4,714	4,574	14,343	187	931	6,391	19,988	118	765	......	....	..	......	118	765
Taylor	1,374	5.372	3,733	15,619	307	1,675	5,414	22,666	31	496	2	35	14	141	47	672
Union	1,252	4,652	2,606	11,729	266	1,035	4,124	17,416	34	204	....	..	28	215	62	419
Van Buren	10,134	26,790	19,817	73,742	1,965	8,564	31,916	109,096	151	1,095	8	57	756	5,106	918	6,258
Wapello	2,549	7,514	5,721	19,656	418	1,806	8,688	28,976	80	643	41	270		......	121	913

TABLE NO. I.—CONTINUED.

SHEEP.

County.	Number and Value.								Eligible to Registry.							
	Lambs Under One Year.		Ewes.		Rams and Wethers.		Total.		Shropshire.		Other Coa'se Wool Sheep.		Fine Wools.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value	Number.	Value.
Warren	493	$ 1,860	2,430	$ 9,975	441	$ 1,666	3,369	$ 13,501	143	847	26	396	....	..	169	1,243
Washington	753	3,106	2,342	10,982	136	1,030	3,231	15,118	53	863	7	70	...	.....	60	933
Wayne	387	1,183	1,639	5,795	40	201	2,066	7,179	46	378		...	..	.	46	378
Webster	309	1,018	1,382	6,836	285	1,018	1,976	8,872	1	10	16	215	10	100	27	325
Winnebago	444	935	1,196	4,085	145	638	1,785	5,658	15	225	...	.....		....	15	225
Winneshiek	2,050	5,185	5,963	20,966	312	1,292	8,325	27,443	61	547	2	33		...	63	580
Woodbury	6,111	22,559	2,378	10 412	459	2,534	8,948	35,505	116	660	15	161	.....	....	131	821
Worth	585	1,602	1,645	5,011	107	401	2,337	7,014	1	15		.. ..		....	1	15
Wright	497	2,160	1,545	6,404	61	373	2,103	8,937	61	710	....	...	....	....	61	710

GPOUP NO. VIII.

TABLE NO. I.

MULES, ASSES, GOATS AND OTHER FARM ANIMALS.

County.	Mules.		Asses.		Goats.		Other Farm Animals.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Total for State	*44,016*	*$3,455,647*	*1,367*	*$ 71,121*	*21,140*	*$ 75,998*	*209*	*$ 9,553*
Average Value	....	*78 50*	....	*52.03*	....	*2.74*	....	*45.70*
Adair	609	$ 45,638	10	$ 1,200	178	$ 698	....	$ ....
Adams	695	57,107	131	1,649	675	2,152	2	75
Allamakee	69	3,318	7	192	407	1,201	....	....
Appanoose	676	45,409	12	2,367	422	1,536	2	75
Audubon	483	39,148	30	1,304	11	17	....	....
Benton	472	35,184	8	1,147	321	958	....	787
Black Hawk	148	11,498	18	501	94	559	25	1,185
Boone	381	27,777	3	125	262	885	....	....
Bremer	82	4,819	3	215	274	1,044	....	....
Buchanan	148	9,990	1	10	79	222	....	75
Buena Vista	282	17,691	3	375	191	1,486	....	....
Butler	152	11,836	4	140	343	1,702	....	....
Calhoun	308	24,722	7	1,930	52	150	17	484
Carroll	463	33,247	2	151	73	243	....	....
Cass	1,064	100,440	3	705	159	514	....	....
Cedar	841	73,393	11	860	21	57	....	....
Cerro Gordo	141	10,034	2	120	15	55	....	....
Cherokee	182	14,946	5	37	29	105	....	....
Chickasaw	59	3,351	....	....	138	548	....	....
Clarke	391	31,978	2	410	1,662	4,272	....	....
Clay	230	14,526	11	595	109	$ 363	....	....
Clayton	116	8,825	19	325	111	414	27	270
Clinton	183	12,915	2	280	7	23	....	....
Crawford	651	47,759	7	327	723	2,854	....	....
Dallas	468	39,876	143	519	272	295	....	....
Davis	557	45,853	6	265	10	15	6	650
Decatur	528	35,536	18	662	357	1,069	....	....
Delaware	188	14,460	103	430	932	3,339	2	80
Des Moines	284	23,275	2	55	323	1,173	2	51
Dickinson	159	7 853	4	282	37	184	....	....
Dubuque	157	9,475	5	34	30	207	....	....
Emmet	143	10,189	16	183	60	331	....	....
Fayette	248	13,312	11	1,435	47	127	....	....
Floyd	55	3,659	1	250	78	176	....	....
Franklin	151	8,563	....	....	218	896	....	....
Fremont	1,622	141,730	28	3,980	387	2,094	4	1,900
Greene	312	25,042	2	1,500	28	86	....	....
Grundy	215	16,673	2	210	12	32	....	....
Guthrie	427	34 261	10	1,016	492	1,353	....	....
Hamilton	328	22,374	30	227	44	133	....	....
Hancock	157	10,658	4	80	93	179	52	2,400
Hardin	433	32,320	7	740	23	71	....	....
Harrison	991	74,028	22	922	227	666	....	....
Henry	346	29,602	7	2,050	433	1,267	....	....
Howard	35	2,515	4	85	7	414	....	....

TABLE NO. I.—CONTINUED.

MULES, ASSES, GOATS AND OTHER FARM ANIMALS.

County.	Mules.		Asses.		Goats.		Other Farm Animals.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Humboldt	192	16,092	1	100	130	750	....	.
Ida	424	36,840	6	630	107	760	....	..
Iowa	661	54,223	....	....	241	578	......	
Jackson	249	20,199	2	80	599	2,372	....	......
Jasper	905	72,024	11	2,265	592	2,544	.. ...	... ..
Jefferson	194	15,917	4	440		48	....	....
Johnson	620	43,977	4	1.310	1	26	....	..
Jones	307	23.491	3	235	311	1,157	....	... .
Keokuk	489	43,097	18	3,197	250	757	....	... .
Kossuth	248	16.305	13	530	55	155	....	... .
Lee	792	64,352	18	781	752	2,339	. .....	... .
Linn	418	30,522	18	206	53	225	....	......
Louisa	312	30,730	2	700	73	239	......	. ....
Lucas	383	31,482	1	300	304	817	......	.. ...
Lyon	130	7,626	3	315	20	43	......	....
Madison	761	53,968	14	1,320	1,007	3,812	....	....
Mahaska	679	52,232	15	1,473	237	1,076	... ..	....
Marion	663	53,365	86	3,569	67	264	.. ...	....
Marshall	443	31,732	7	240	112	223	8	 160
Mills	903	81,054	9	396	119	345	10	380
Mitchell	60	4,693	4	225	21	74	2	100
Monona	844	74,819	8	370	330	1,044	....	... ..
Monroe	602	48,632	1	1,200	421	1,472	.....	....
Montgomery	677	61,182	6	105	142	386	7	55
Muscatine	425	35,306	1	300		... ...	..	....
O'Brien	174	13,020	1	100	102	399	....	....
Osceola	127	7,613	...		18	98	... ..	... ...
Page	1,282	105,625	17	1,080	731	2,783	....	....
Palo Alto	162	12,715	4	220	15	43	... .	
Plymouth	358	25,063	2	55	69	238	....	....
Pocahontas	388	23,541	5	561	163	832	2	150
Polk	760	61,636	65	580	210	662	12	500
Pottawattamie	1,416	117,809	11	1,725	47	146	....	. ..
Poweshiek	614	54,096	2	750	70	246	....	......
Ringgold	833	62,261	17	1,740	326	936	. ....	....
Sac	502	36,095	. .	....	....	...	....	... ...
Scott	378	29,989	5	620	77	298	....	......
Shelby	579	39,569	6	273	181	571	...	......
Sioux	344	22.337	14	385	30	157	...	......
Story	428	36,745	93	465	219	2,018	....	....
Tama	357	25,934	8	176	355	763	......	. ..
Taylor	753	59,100	21	2,890	645	1,805	.	......
Union	337	27,625	.	..	207	545	....	. . ..
Van Buren	526	41,279	41	2,849	97	385	....	......
Wapello	747	52,591	18	1,220	321	894	....	.....
Warren	657	$ 46,079	9	$ 570	257	$ 821	29	$ 176
Washington	553	51,681	12	1,560	230	973		....
Wayne	1,055	83,337	6	1,375	87	815	.. ..	....
Webster	392	27,694	..	......	161	716	....	......
Winnebago	62	4,320	3	45	94	471	...	. .
Winneshiek	81	5,445	10	422	82	339	...	......
Woodbury	872	71,683	12	1,183	188	605	... .	... ...
Worth	69	4,316	......	...	8	20	..	....
Wright	199	15,781	1	100	27	60	....	....
Grand total	41.016	$3 455,647	1,367	$ 71,121	21,140	75,998	209	$ 9,553

GROUP—NO. IX.

TABLE NO. I.

Number and Value of Chickens and Other Fowls, Quantity and Value of Eggs, and Value of Vegetables, by Counties.

County.	Chickens.		Other Fowls.		Total Fowls.		Eggs Produced.		Vegetables.
	Number.	Value.	Number.	Value.	Number.	Value.	Number dozen.	Value.	Value.
Grand total	22,409,837	$ 7,229,536	1,061,226	$ 853,648	23,471,063	$ 8,083,184	79,456,462	$ 10,794,193	$ 3,445,127
Average value	......	$ .32	....	$ .80	....	$ .34	.....	$ .13	....
Adair	206,428	$ 72,603	10,195	$ 8,426	216,623	$ 81,029	796,949	$ 108,111	$ 24,751
Adams	190,697	70,038	5,689	3,865	196,386	73,903	808,332	99,171	18,363
Allamakee	183,962	50,127	7,295	6,896	191,257	57,023	706,219	96,710	13,548
Appanoose	187,432	68,043	9,343	8,707	196,775	76,750	583,033	87,184	25,105
Audubon	184,439	53,587	7,748	5,540	192,187	59,127	623,758	79,377	11,652
Benton	315,072	104,458	12,287	9,476	327,359	113,934	952,869	132,548	32,995
Black Hawk	226,278	76,026	8,655	6,710	234,933	82,736	740,41	130,983	29,777
Boone	375,934	110,618	21,077	13,335	397,011	123,953	1,036,995	148,726	31,335
Bremer	182,987	58,992	15,757	11,677	198,744	70,669	529,097	71,617	22,380
Buchanan	226,327	69,975	10,674	10,020	237,001	79,995	756,202	103,518	21,324
Buena Vista	193,594	57,509	11,390	6,868	204,984	64,377	721,720	86,938	17,048
Butler	251,250	83,842	8,364	8,140	259,614	91,982	842,590	117,634	20,702
Calhoun	246,388	71,610	13,203	9,462	246,388	81,072	803,483	101,362	21,486
Carroll	267,342	75,804	11,495	7,504	278,837	83,308	885,563	109,649	16,063
Cass	214,923	71,407	6,402	4,599	221,325	76,006	707,671	97,256	17,430
Cedar	253,900	88 584	13,594	12,303	266,203	100,887	896,992	120,614	17,629
Cerro Gordo	188,309	66,773	13,517	11,162	201,826	77,935	656.312	121,554	47,430
Cherokee	194,792	55,402	5,983	3,660	200,775	59,062	784,832	99,107	17,210
Chickasaw	184,661	55,677	21,457	9,161	206,118	64,838	647,566	85,349	13,238
Clarke	134,756	53,438	6,282	6,183	141,038	59,621	537,394	69,436	19,149
Clay	153,864	45,595	8,860	6,301	162,724	51,896	582,336	78,015	5,882
Clayton	303,638	89,381	11,855	12,840	315,493	102,221	1,079,677	155,465	41,229
Clinton	261,795	77,317	23,184	18,441	284,979	95,758	783,463	114,409	12,189
Crawford	262,820	73,193	12,761	7,852	275,581	81,045	947,471	115,436	18,343
Dallas	280,600	94,450	10,291	9,404	290,891	103,854	1,011,537	138,274	29,014

TABLE NO. I.—CONTINUED.

County.	Chickens.		Other Fowls.		Total Fowls.		Eggs produced.		Vegetables.
	Number.	Value.	Number.	Value.	Number.	Value.	Number. Dozen.	Value.	Value.
Davis	223,347	$ 72,195	13,102	$ 17,560	236,449	$ 89,755	806,462	$ 103,852	$ 25,024
Decatur	176,091	84,192	20,270	14,712	196,361	98,904	743,555	91,737	23,658
Delaware	212,679	68,773	13,260	10,825	225,939	79,598	679,832	88,337	35,891
Des Moines	233,863	79,728	5,992	4,625	239,855	84,353	895,094	125,048	44,088
Dickinson	93,418	29,056	8,277	5,864	101,695	34,920	323,340	44,567	10,968
Dubuque	242,796	80,258	13,663	12,739	256,459	92,997	825,054	115,795	624,431
Emmet	106,758	34,536	10,197	7,277	116,955	41,813	362,174	57,824	16,605
Fayette	283,056	89,284	11,978	10,709	295,034	99,993	1,083 473	156,413	25,495
Floyd	191,560	61,667	8,885	8,073	200,445	69,740	759,509	116,899	43,429
Franklin	215,605	63,059	12,330	8,313	227,935	71,372	649,970	84,796	31,614
Fremont	176,023	64,029	4,706	3,481	180,729	67,510	625,520	81,316	23,750
Greene	252,507	85,246	16,919	13,457	269,426	98,703	845,795	108,540	44,058
Grundy	218,987	75,526	6,327	4,390	225,314	79,916	726,134	98,005	32,086
Guthrie	217,515	66,595	9,986	8,499	227,501	75,094	674,302	98,695	61,324
Hamilton	285,192	88,451	14,688	11,925	299,880	100,376	829,301	111,932	47,061
Hancock	177,778	54,912	16,668	10,957	194,446	65,869	582,385	75,717	13,413
Hardin	270,359	82,776	12,616	8,839	282,975	91,615	945,117	126,975	46,510
Harrison	266,809	77,894	7,324	4,746	274,133	82,640	1,150,310	154,224	49,500
Henry	253,723	93,087	6,938	7,966	260,661	101,053	1,226,816	171,309	24,111
Howard	140,694	40,590	7,136	6,494	147,830	47,084	445,508	62,835	33,124
Humboldt	149,575	49,439	9,375	7,013	158,950	56,452	573,452	77,812	14,499
Ida	154,087	46,799	8,400	4,393	162,487	51,192	568,911	72,198	8,024
Iowa	245,188	77,148	4,170	9,184	256,358	86,332	904,710	119,761	41,264
Jackson	234,380	72,874	16,666	16,591	251,046	89,465	697,298	90,080	13,675
Jasper	343,614	104,166	26,108	20,847	369,722	125,013	1,112,972	147,310	36,095
Jefferson	234,127	81,653	8,972	7,269	243,099	88,922	951,899	132,423	24,461
Johnson	296,790	91,285	15,020	11,616	311,810	102,901	972,795	112,930	15,175
Jones	208,505	70,001	12,325	11,475	220,830	81,476	684,547	92,321	23,390
Keokuk	313,981	103,664	8,900	7,115	322,881	110,779	1,234,746	169,645	54,501
Kossuth	305,429	96,310	24,938	18,140	330,367	114,450	1,356,510	147,502	20,891

Lee	298,049	103,185	11,469	11,328	309,515	114,513	1,204,631	165,310	82,580
Linn	346,621	128,082	9,959	16,523	356,580	144,605	1,057,471	143,112	55,560
Louisa	159,611	61,790	8,593	9,094	168,204	70,884	644,651	89,385	30,680
Lucas	146,267	53,352	6,537	5,682	152,801	59,034	636,166	82,904	23,370
Lyon	171,205	52,178	6,432	3,522	177,637	55,700	683,415	92,170	11,605
Madison	288,243	79,483	8,718	8,912	236,961	88,395	856,522	115,174	27,548
Mahaska	324,157	91,127	7,930	5,514	321,215	96,291	1,131,394	156,551	34,580
Marion	314,184	105,937	12,291	9,400	326,475	15,337	1,131,467	142,856	46,632
Marshall	251,610	80,106	7,089	4,402	258,699	84,508	861,444	116,652	72,829
Mills	166,550	53,187	4,884	3,359	171,434	56,546	516,743	67,468	29,159
Mitchell	161,429	45,731	6,933	6,590	168,362	52,321	638,069	91,958	18,375
Monona	192,321	56,006	6,995	3,467	199,316	59,473	618,625	78,224	25,922
Monroe	128,717	48,125	5,874	6,028	134,591	54,153	505,266	76,129	29,551
Montgomery	177,762	64,319	4,210	3,299	181,972	67,618	732,609	99,090	49,685
Muscatine	196,596	55,011	8,186	6,877	202,679	61,355	654,983	103,045	67,510
O'Brien	172,967	52,406	8,658	5,806	181,625	58,212	720,788	87,683	15,100
Osceola	110,354	32,174	3,791	2,242	114,145	34,416	392,237	51,680	8,187
Page	246,523	88,193	6,517	4,676	253,040	92,869	840,307	99,496	28,970
Palo Alto	168,298	52,003	15,355	12,626	182,940	64,373	709,380	94,658	13,876
Plymouth	268,775	79,186	10,072	6,451	278,847	85,637	864,281	114,502	17,057
Pocahontas	219,299	68,803	19,817	13,512	239,116	82,315	750,176	98,999	9,051
Polk	359,903	116,799	9,053	8,166	368,956	124,965	1,115,915	179,943	83,182
Pottawattamie	392,300	122,671	11,053	7,134	403,353	129,805	1,624,901	208,217	77,138
Poweshiek	250,094	81,834	13,059	9,797	263,153	91,631	866,615	112,264	26,469
Ringgold	167,569	63,717	7,398	6,814	174,967	70,5[illegible]1	680,884	92,881	24,719
Sac	231,311	68,058	11,365	6,884	242,676	71,942	780,736	96,507	14,608
Scott	257,687	83,617	19,282	14,687	276,969	98,304	1,024,449	163,933	96,368
Shelby	222,875	72,145	8,122	5,279	230,997	77,424	753,901	104,778	16,591
Sioux	269 239	83,518	6,630	4,885	275,869	88,403	1,033,732	129,042	8,857
Story	345,498	114,859	11,203	7,761	356,701	122,620	1,160,700	155,479	27,986
Tama	348,485	91,272	19,396	15,151	367,881	106,423	897,486	161,790	21,939
Taylor	212 088	75,840	6,602	5,432	218,690	81,272	822,691	106,839	28,292
Union	137,897	53,492	4,511	3,409	142,408	56,901	479,281	68 005	25,494
Van Buren	250,286	91,918	8 125	9,968	258,411	101.886	1,135,297	163,671	45,268
Wapello	195,587	65,328	7,042	5,363	202,629	70,691	576,252	82,728	27,641
Warren	249,100	79,910	7,810	6,065	256,910	85,975	812,751	116,048	22,260
Washington	301,600	107,032	10,104	9,798	311,704	116,830	1,030,534	150,366	30,767
Wayne	177,047	65,776	11,193	13,887	188,240	79,663	563,035	79,423	18,988
Webster	270,000	81,875	13,208	8,734	283,208	90,609	784,166	117,114	21,101
Winnebago	124,806	34,103	7,763	5,976	132,569	39,079	510,103	65,497	5,499
Winneshiek	269,703	75,054	14,783	12,056	284,486	87,110	1,025,988	145,907	17,037
Woodbury	247,002	77,815	7,252	4,320	254,254	82,135	1,019,321	130,225	26,645
Worth	121,586	35,642	8,101	7,264	129,687	42,906	434,044	56,236	6,279
Wright	172,012	57,235	14,367	11,883	186,379	69,118	513,091	72,713	20,374

SUMMARY OF FARM STATISTICS.

Description.	Number of Farms.	Number of Acres.	Value of Land.	Value of Buildings.	Value of Farm Implements.	Total Value of Land and Buildings.	Total Value of Lands, Buildings and Farm Implements.
Farms occupied by owners.	138,224	19,882,464	984,204,235	218,813,327	27,749,330	1,203,017,562	1,230,776,892
Land rented by owners		2,044,197					
Farms occupied by renters.	70,939	11,301,448	567,902,214	84,937,648	13,492,038	652,839,862	666,331,900
Grand total for State	209,163	33,228,109	1,552,106,449	303,750,975	41,232,368	1,855,857,424	1,897,089,792

Average number of acres in the farms of the state	158⅓
Average value farm lands per acre, including improvements	$56.00
TOTAL AVERAGE VALUE OF THE IOWA FARM	$8,272.00
Average value farm implements per farm	$192.00
Average value land per acre, without improvements	$46.71
Average value per acre of farm improvements	$9.29
Per centage of farms occupied by owners	65 per cent
Per centage of farms occupied by renters	35 per cent

SUMMARY OF AVERAGES.

FARM CROPS—1905.

Crop.	Average yield per acre.	Average farm price Dec. 1, 1905.	Average val. per acre.
Corn	37.2 bu	$ .35	$13 02
Wheat Winter	20.2 bu	.72	14 54
Spring	14.4 bu	72	10 37
Oats	33.8 bu	.25	8 45
Rye	18 0 bu	.52	9 36
Barley	27.5 bu	.33	9.07½
Flax	9.8 bu	.90	8.82
Potatoes	84.0 bu	50	42 00
Hay—Tame	1 8 tons	5.50	9 90
Hay—Wild	1.2 tons	4.50	5.40

Total value soil products for 1905	$302,286,212 00
Average value per farm of 158½ acres	1,445 00
Average value per acre	9,12
Average rate of interest on total investment Iowa farms	16¼ per cent

SUMMARY OF CATTLE STATISTICS.

Description.	Number.	Value.	Average val. per head.
Calves under one year	1,354,360	$11,471,714	$ 8.47
Steers one year and under two	621,225	11,700,852	18.84
Steers two years and under three	490,041	15,075,776	30.76
Steers over three years old	72,103	2,760,693	38.29
Bulls over one year old	87,088	3,309,239	38 00
Heifers one year and under two	480,950	6,948,542	14 45
Milch cows over two years old	1,315,888	31,152,808	23.67
Cows, other than milch, over two years old	333,386	8,600,133	25.80
Totals	4,755,041	$91,019,753	19.15

NOTE:—The average value per head as given by the State census Report of 1905 is about fourteen per cent lower than the average value as reported by the Statistical Bureau of the U S. Department of Agriculture for the same period, they reporting the average value per head on January 1, 1905 at $21 78 and on January 1, 1906, at $23.44, the last being an increase of more than 20 per cent. Taking the same number of head reported by the State Census and the average value as estimated on January 1, 1906, by the Department at Washington would increase the valuation by $20,438,408 placing their total value at $111,458,161.

Average number cattle per farm	23
Average number milch cows per farm	6
Number of cattle eligible to registry	89,388
Average value of cattle eligible to registry	$53.15
Per centage of total number of cattle eligible to registry	2 per cent

SUMMARY OF HORSE STATISTICS.

Total number of horses as per state census, 1905	1,258 659
Total value of horses as per state census, 1905	$79,280,695
Average value of horses as per state census, 1905	64.08
*Average value of horses as per Statistical Bureau United States Department of Agriculture on January 1, 1906	86.31
*Total value of horses as per statistical Bureau United States Department of Agriculture on January 1, 1906	106,003,025
Average number of horses per farm	6
Number of horses eligible to registry	8,167
Average value of horses eligible to registry	$305.24
Percentage of total number of horses eligible to registry	1½ per cent

SUMMARY OF SWINE STATISTICS.

Total number of swine as per state census, 1905	6,447,630
Total value of swine as per state census, 1905	$34,464,153
Average value of swine as per state census, 1905	5.35
**Average value of swine as per Statistical Bureau of U. S. Department of Agriculture, January 1, 1906	7.20
**Total value of swine as per Statistical Bureau of U.S. Department of Agriculture, January 1, 1906	$46,392,268
Total number of swine eligible to registry	110,035
Average value of swine eligible to registry	$ 12.63
Percentage of total number of swine eligible to registry	1.7per cent

SUMMARY OF SHEEP STATISTICS.

Total number of sheep, as per state census, 1905	500,743
Total value of sheep, as per state census, 1905	$1,987,364.00
Average value of sheep, as per state census, 1905	3.97
***Average value of sheep, as per Statistical Bureau, U. S. Department of Agriculture, January 1, 1906	4.59
***Total value of sheep, based on average of $4.59 per head	$2,297,824.00
Number of sheep eligible to registry	9,988
Average value of sheep, eligible to registry	$ 8.64
Percentage of total number of sheep eligible to registry	2 per cent

SUMMARY OF MULES AND ASSES STATISTICS.

Total number of mules and asses, as per state census, 1905	45,383
Total value of mules and asses, as per state census, 1905	$3,526,768.00
Average value of mules and asses, as per state census, 1905	77.71
Average value of mules and asses, as per Statistical Bureau, U. S.... Department of Agriculture, January 1, 1906	90.48
Total value of mules and asses, using average value as reported by the U. S. Department of Agriculture, and number as shown by state census	$4,106,310

*Note—It will be noted that the Statistical Bureau of the United States Department of Agriculture places the average value of horses in the state at $86.31, an increase over the average reported by the state census on January 1, 1905 of $22.23. Using the increased average valuation before mentioned the total increased value of horses would be $25,722,330.

**Note:—This increase in the total value of swine in the state over that given in the census report is the result of the increased average value per head, as reported by the U. S. Department, January 1, 1906, using the total number reported by the state census.

***Note:—The increase in the average value per head, as reported by the U. S. Department of Agriculture, over that shown in the state census increases the total valuation by $310,460.

SUMMARY OF THE TOTAL AND AVERAGE VALUE OF LIVE STOCK IN IOWA, AS SHOWN BY THE STATE CENSUS REPORT OF 1905, AND THE STATISTICAL BUREAU OF THE U. S. DEPARTMENT OF AGRICULTURE.

From Iowa Census Report, 1905.				From Statistical Bureau U. S. Department of Agriculture, January 1, 1906.	
Live Stock.	Number.	Total value.	Average value per head	Average value per head	Total value.
Horses	1,238,659	$ 79,280,695	$64.00	$86 31	$106,003,025
Mules and Asses	45,383	3,526,768	77.71	90.48	4,106,310
Cattle	4,755,041	91,019,753	19.14	23.44	111,458,161
Swine	6,447,630	34,464,153	5 35	7.20	46,392,268
Sheep	500,743	1,987,364	3.97	4.59	2,297,824
Goats	21,140	75,968	....	.....	75,968
Other Farm Animals	209	9,553	...	..	9,553
Totals	13,008,805	$210,364,284			$270,343,109

SUMMARY OF TOTALS.

Total value of live stock, all kinds	$270,343,109
Total value farm crops, 1905	302,286,212
Total value fowls	8,083,184
Total value eggs, 1904	10,794,193
Total value dairy products	30,687,274
Total value fruits	5,355,554
Total value vegetables	3,445,127
Total value live stock and farm products	$630,994,653
Total value Iowa farms, improvement and implements	1,897,089,792
Grand total	$2,528,084,445

Total rural population of Iowa as shown by State census report, 1905... 1,142,114

WALLACES'
FARMER

PART IV.

PROCEEDINGS

OF THE

Annual Meeting Iowa Swine Breeders' Association.

1905.

OFFICERS OF ASSOCIATION.*

President—W. Z. Swallow,	Waukee.
Vice President, 1st—Wm. D McTavish,	Coggon.
Vice President, 2d—S. M. Pedrick,	Ottumwa.
Secretary and Treasurer—C. C. Carlin,	Des Moines.

The Iowa Swine Breeders' Association held its annual June meeting at Des Moines on the afternoon and evening of Tuesday, June 13. There was a greater attendance than for a number of years past and considerable interest was displayed throughout the entire session. Owing to illness in the family of President Swallow, he was unable to be present and the meeting was president over by Vice-President S. M. Pedrick, of Ottumwa. Mr. Swallow, however, sent a brief address which was presented as follows.

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*Election of officers occurs during State Fair week. See Part Eleven of Year Book for latest elected officers.

PRESIDENT'S ADDRESS.

W. Z. SWALLOW, WAUKEE, IOWA.

I want to congratulate this association, as well as the farmers of Iowa who make hog raising a branch of their business, upon the satisfactory conditions of the past year, as well as the promise of a continuance of fairly good times in our line of work. The pork market of the year has shown no extremes of prices, either high or low, but a range in price has ruled that at all times left a fair profit to the producer. To my mind, this is a state of affairs which affords greater benefit to the main body of hog raisers, and to the breeders of registered stock, than any period of unusually high figures. Extremely high prices, except in time of extraordinary short supply of hogs, are pretty sure to lead to an unhealthy stimulation, over production, and a slump to a point as much too low. At times the low point has been below actual cost of growing. I believe it is generally conceded that the packers, through unlawful trusts or combinations, are so controlling prices at the great markets as to deprive us of profits that are rightfully ours, and I do not wish to be understood as being in any but strenuous opposition to their unfair domination. I suggest that our committee on resolutions present a resolution which shall voice the sentiments of the Iowa Swine Breeders as a body on that subject.

I am pleased that since our last meeting the good sound sense of breeders has kept them from indulgence in the unhealthy boom ideas that have been a prominent feature among our eastern brothers.

So far as I have learned, losses from disease have been very small, though a few localities have suffered, and one or two of them quite severely.

The lessons of the great show at St. Louis last season should lead us to use both care and caution in our recommendation of judges for the Iowa State Fair of 1905.

As breeders, we feel that there is encouragement as well as an outlook for good trade in the excellent crop prospect, increased corn acreage and maintenance of fair pork prices.

Reports from Iowa breeders indicate that there is something of an increase in the pig crop over last year, and that losses of young pigs have been about normal.

The good that has been done in the interest of breeders through the work of this organization during the year just closed, should encourage every breeder to show his confidence and approval by becoming a member, and by attending every meeting. Since our last June session we have succeeded in having the management of the Iowa State Fair increase the number of classes, increase the number of places in each class, and increase not only the amount of cash of each premium, but also the total cash paid as premiums on hogs to a figure that is greater than is paid by any other hog show on earth, barring special prizes offered by record associations and others. We have, also, gained a more liberal treatment to exhibitors, and have the assurance that the Iowa State Fair grounds will in another year be graced by the best hog barns and conveniences that can be devised.

In conclusion I wish to refer to the fact that the Iowa Swine Breeders' Association is the oldest live stock organization now in existence west of the Mississippi, and it is not a little creditable to its membership to note that its meetings have always been lively and interesting.

Hon. James Wilson, Secretary of Agriculture, wrote that the pressure of official duties at Washington prevented him from being in attendance. He forwarded his paper, however, which was read by the Secretary.

THE CORN CROP IN PORK PRODUCTION.

JAMES WILSON, SECRETARY OF AGRICULTURE.

It is unnecessary to state before the Iowa Swine Breeders' Association, that corn is the great grain crop of Iowa. Its value in the year 1904 was over $100,000,000, nearly two-thirds that of the total grain crop of the state, and about one-tenth that of the total corn crop of the Union. Add the potato and hay crops of Iowa to the grain crop, and the value of the corn raised exceeds one-half of the whole.

This great crop is valuable both as a direct source of revenue and for feeding; it makes possible the horse, beef, dairy, mutton, poultry and pork industries of the state, and the secret of your agricultural wealth rests not only in your fertile soil, but also in the fact that a large part of the feed produced on your farms is fed to your live stock. The importance of this can hardly be over-estimated. You are familiar with the adage, "Live stock husbandry is the basis of successful agriculture". This fact can be stated in other language. Where a large part of the products of the farms is fed to live stock, there is the greatest yield of products, both animal and vegetable, the sales from the farms are greatest, the land has the greatest value, there is the greatest investment in buildings and machinery, live stock has its greatest value, and there is the least expenditure for commercial fertilizers. According to the twelfth census, the total value of all farm property in Iowa in 1899 was $1,834,345,546, Illinois leading with a little over two billions of dollars. Of this great sum, your investment in live stock was $278,830,096—far ahead of that of any other state. The total value of your farm products in 1899 was $365,411,528, nearly twenty millions more than any other state produced. Of these products, which include the value of the animals sold, you fed grain and hay to the value of nearly one-third of the whole, and of all the farm products fed to live stock in the United States during the year mentioned, nearly one-ninth was fed in Iowa. The percentage of products not fed to the total value of farm property for the entire country was 18.3; that for Iowa was 14.4, Wisconsin and Pennsylvania having a percentage of 14.3, Illinois 13.2, and the District of Columbia, where conditions are anomalous, 7.3. On the other hand in those states whose percentage of products not fed to live stock runs from 30 to 45, the conditions are reversed; the total output is much smaller, the expenditures for commercial fertilizers are large, and the value of farm property proportionately less. More than 60 per cent of the farms of Iowa derive their principal income from live stock and dairying, and we can prove our statement in yet another way by showing that the richest and most productive states are those, the largest percentage of whose farms are in this class, and that, generally speaking, those whose principal income is not live stock, are the poorest in actual agricultural wealth and produce the least value in the aggregate. The scope of this paper will not permit an exhaustive treatment of this phase of the subject, and I touch upon it only as a digression. After all, the main problem before us is the maintenance of the fertility of the soil. It is doubtful whether this can be done by the use of commercial fertilizers alone; aside from the profits of the business, live stock must be raised on every farm to make possible the growing of grain and fibre for human needs.

The corn and hog crops of Iowa go hand in hand. More than one-seventh of the value of the animals reported by the twelfth census in Iowa was represented by the hogs. There were more than four hogs for every man, woman and child in the state, 175 for each square mile of land surface, and 180 for each square mile of farm area; no other state approaches yours in these respects. Out of a total live stock valuation of $271,844,034 in Iowa, hogs comprised $44,000,000 in round numbers, but when one considers that the average sow raises at least five pigs a year, the actual earning capacity of this capital far exceeds the principal. Many flings are thrown at Iowa on account of her hogs; the state is often called "the land of corn and hogs"; this phrase expresses the truth, but it is not one to be ashamed of. Corn and hogs have paid mortgages, built schools and churches, and educated children. A man getting a start in farming in Iowa relies on this combination to put him on his feet.

The use of corn in hog feeding must, however, be tempered with judgment. It is not only a very palatable feed, but it is rich and excessive feeding, on it alone animals lose appetite and it may seriously affect the health of the herd. In the case of breeding animals, exclusive corn feeding may cause diminished fertility if not actual sterility and barrenness. This is particularly true of hogs, and it is also probably true that heavy corn feeding, especially early in the fall, lessens vitality and renders hogs more susceptible to disease. Furthermore, where corn is fed alone, it is not generally an economical feed; the grains are small and a large amount of feed is required to make a given gain. The judicious use of other feeds to supplement corn will often effect a saving in excess of their actual value.

To get the greatest value from the corn fed, it should be combined with nitrogenous mill feeds, (bran, linseed oil meal, gluten meal, gluten feed, etc.), with dairy by-products (skim milk, butter milk, and whey), or with pasture, preferably on animal forage plants such as rape, sorghum, oats, wheat, rye, peas, and combinations of these.

The variety made possible by the use of supplementary feeds not only makes a more healthful and effective ration economically but as a general rule the effect on the quality of the pork produced is beneficial. All these factors are worthy the more careful consideration from the pig feeder.

To give concrete illustrations of these points, I will refer in more detail to the results which have been obtained by investigators at our American Experiment Stations.

You are all more or less familiar with the relative importance of those constituents of feed which produce blood, bone, and muscle in the animal body, and those which produce fat and supply the principal part of the warmth or energy needed; the former being the nitrogenous compounds, termed protein, and the latter the carbohydrates and fat, commonly called the carbonaceous compounds. Oil meal, bran, packing house by-products, peas, and dairy by-products are examples of nitrogenous pig feeds; shorts, corn, wheat, and rye are carbonaceous ones. Grains like oats and barley occupy a middle ground. As we will observe later the effect of a feed on the quality of the carcass may be of more importance than its nitrogen or carbohydrate composition.

A further point of importance, especially in feeding young animals is the mineral composition of the feed. This is represented by lime, phosphoric acid, and several minor substances. Mineral content or ash is very important for the proper development of bone, and corn is, unfortunately, low in ash.

THE USE OF NITROGENOUS CONCENTRATES.

Among the most valuable feeds to supply protein and mineral matter in a corn meal ration are the by-products of packing houses, beef meal and tankage. These products are prepared from products which were formerly wastes; those suitable for animal feed are made largely from scraps of meat, fat, and bone and have been cooked by steam. They are high in ash, protein and fat, but low in carbohydrates. Tankage has been found to lessen very materially the amount of grain required to make a given gain, and it also increases the gains made. Tankage-fed pigs handle better and their coats are in better condition than those on corn meal alone. The amount of tankage fed should not exceed one-fifth the entire ration, and smaller amounts will probably be found more satisfactory. A ration of ten parts of a mixture of equal parts of corn meal and shorts and one part tankage was found to be particularly valuable by the Indiana Station. The Iowa Station fed five parts of corn meal to one part of tankage, their gains being larger than those in the Indiana test but somewhat less economical, particularly as to the feed saved by the use of tankage. In the Indiana test, from 33.5 to 38.9 per cent of the corn meal ration was saved by the use of tankage; in the Iowa test from 20.8 to 30.4 per cent was saved. Beef meal fed at the Iowa Station effected a saving of 24.9 per cent in the amount of grain required for 100 pounds of gain.

THE USE OF DAIRY BY-PRODUCTS.

The use of dairy by-products in pig feeding makes possible both the most economical returns for the ration and the highest quality in the carcass.

The injurious effects of feeding a ration of corn meal only can be largely overcome by the addition of skim milk, and comparative tests between rations of corn meal only and one of corn meal and milk have usually shown advantages for the milk ration out of all proportion to the actual feeding value of the milk. For some time the real cause of this was in doubt, but chemists have quite recently shown that there is a ferment or enzyme in milk which has a digestive action, rendering from 1 to 3 per cent of the insoluble proteids digestible. Doubtless this ferment is accountable for the high efficiency of a grain and milk ration.

At the Tennesee Experiment Station pigs on corn meal only made average daily gains of one pound, eating feed at the rate of 416 pounds of dry matter for each 100 pounds of gain made. Pigs on a ration of corn meal and dairy by-products made gains at the rate of 2.3 pounds per day per pig, and the dry substance in the feed eaten was only 293 pounds for each 100 pounds of gain, although the pigs ate a great deal more feed than those on corn meal only, the difference being more than made up by the large gains. The net profit of feeding these pigs for sixty days, value of manure and cost of care and feed being considered, was respectively $7.69 and $12.06 per lot of three pigs. A peculiar feature of this experiment was that the money cost of feed per 100 pounds gain was considerably greater in the cost of the pigs on dairy by-products; this, like the greater consumption of feed, was offset by the increased gain of the pigs on the more expensive feed. If large results are to be obtained, you may often use expensive methods of feeding. Here is where one's business judgment must be used. Other results at the Tennessee Station show average daily gains of .50 pounds and 1.35 pound for pigs on rations of corn meal only, and corn meal and skim milk, 410 pounds of corn meal in the first case being required for 100 pounds of gain, and 160 pounds of corn meal and 1,190 pounds of milk in the second. In this case the money cost of the skim milk ration was less per one hundred pounds gain, although the total cost was considerably greater than that of the corn meal ration. The results just quoted are the average of two years' investigations.

The Nebraska Station has recently published the results of experiments in which they show the value of skim milk in a corn meal ration. Pigs on the respective rations of corn meal and corn meal and skim milk made average daily gains of .93 pound and 1.57 pounds, consuming 740 and 520 pounds of feed for 100 pounds of gain. The money cost of the gain per 100 pounds was $4.48 and $3.97 respectively, a difference of 51 cents per 100 pounds in favor of the skim milk ration. Please note that the results of these experiments do not show that corn should not be fed to pigs, but that it should not be fed alone. They show how it may be fed profitably.

The effect of the addition of dairy by-products to the ration is especially marked when corn is the only grain fed, but they are also highly valuable in a mixed grain ration. The Utah Experiment Station has conducted a long series of experiments with skim milk in various combinations with barley, wheat, corn, and bran. Some whey was fed in three tests but never in as equal an amount as the skim milk. When grain alone was fed the average of five tests, with a total of fifteen pigs, show an average daily gain of .91 pounds, the amount of dry substance in the feed being 421 pounds for 100 pounds of gain. When grain and milk were fed, the average of eight tests show average daily gains of 1.27 pounds and dry matter eaten at the rate of 334 pounds per 100 pounds of gain. Four tests were made in this series with milk alone. Not only were the gains small, but the feeding value of skim milk was found to be much less when fed alone than when fed with grain. The results at other Stations tend to confirm the ones quoted.

The average of the Danish feeding experiments with pigs show that when fed with grain 600 pounds of skim milk have a feeding value about equal to that of 100 pounds of grain. Prof. Henry has shown that the average of results at the Wisconsin Experiment Station shows 475 pounds of milk to be equal in feeding value to 100 pounds of meal. The value found in the Utah investigations was 431 pounds in one series of experiments, and 380 pounds in the other. Canadian investigators give milk a value of 500 to 600 pounds for 100 pounds of mixed grain.

The best results are obtained when the proportion of skim milk to grain is comparatively small. Large quantities of milk will give the best returns when the pigs are young, and as they grow older it should be decreased. The Massachusetts Station recommends the following rations when an abundance of milk is at the command of the feeder:

RATIONS FOR GROWING PIGS.

Weight of pigs	Rations.
20 to 60 pounds	8 ounces of corn meal to each quart of milk.
60 to 100 pounds	6 ounces of corn meal to each quart of milk.
100 to 180 pounds	3 ounces of corn meal to each quart of milk.

On most farms the supply of milk will be limited and in these cases the same Station recommends the following rations:

RATIONS FOR GROWING PIGS.

Weight of pigs.	Rations.
I. 20 to 180 pounds	3 ounces of corn meal, wheat, rye , or hominy meals to each quart of milk, and then gradualy increase meal to satisfy appetites.
20 to 60 pounds	Milk at disposal, plus mixture of one-third corn meal, one-third wheat bran, and one-third gluten meal to satisfy appetites.
II. 60 to 100 pounds	Milk at disposal, plus mixture of one-half corn meal, one-fourth wheat bran, and one-fourth gluten meal to satisfy apetites.
100 to 180 pounds	Milk at disposal, plus mixture of two-thirds corn meal, one-sixth wheat bran, and one-sixth gluten meal to satisfy appetites.
20 to 60 pounds	3 ounces of corn meal to each quart of milk, and 4 ounces of gluten feed as a substitute for quart of milk.
III. 60 to 100 pounds	Milk at disposal, and mixture of one-half corn meal and one-half gluten feed to satisfy appetites.
100 to 180 pounds	

Whey has a feeding value about half that of milk. It should be fed carefully as it frequently causes stiffening of the joints and lameness.

Dairy by-products obtained from the creamery, cheese factory or skimming station should be pasteurized before being fed. If the feeder used only those produced on his farm, and knows that his cows are free from tuberculosis, this precaution is unnecessary.

THE USE OF PASTURE AND FORAGE CROPS.

The proper use of pasture and forage crops in hog feeding is another means to decrease the amount of grain needed and add to the profits. Grain feeding is always expensive and pasture crops usually give a cheap source of very nutritious feed. By pasture crops I mean not only the grass of the permanent pastures, but such crops as clover, rape, vetches, and the cereals. These feeds have an effect on the pig somewhat similar to that of skim milk; that is to say, they reduce largely the amount of grain needed for a given gain, and add very much to the health and vigor of the hogs. They are useful not only for their actual feeding value but for their effect on the condition of the digestive organs. As there is a great mass of experimental data on this subject, I will refer to it only in a general way.

Generally speaking, pasture alone is not better than a maintenance ration for pigs, and the feeder cannot expect to fatten his hogs in this manner. Dry sows and boars not in service may, however, be carried for a time on such a ration, especially if the pasture is good.

As the value of pasture and milk is similar, it is not surprising to find that pigs on a grain and milk ration gain no special advantage by having pasture in addition. As pasture becomes available, milk may be gradually diminished.

To give the best results for fattening pigs, the pasture should not require them to range over too large an area. Therefore, the greatest amount of feed should be grown on the smallest acreage. For this purpose, the best pasture is that of annual plants which are quite succulent in character. For early spring feeding, fall-sown wheat and rye are excellent; as the season progreses, use oats, wheat or barley. Many like a mixture of oats and peas or barley and peas, sown in equal parts by measure. One of the best feeds to use in late summer and during the fall is rape. Sorghum can also be used at this time. Hogs should not be allowed to roam at will over these crops but they should graze a portion of the field at a time, being confined by temporary fences or hurdles. Feeding in this manner makes possible the maintenance of a large number of animals on a given area and this enriches the soil proportionately. Further, there is no expenditure for labor in handling manure.

To summarize, we may say that a ration which will keep the system of the animals in the best possible condition is important because one can ill afford to suffer losses from this source; feed and land are becoming dearer and the margin of profit naturally less. Furthermore, a healthful ration is important because the public is becoming more and more particular regarding the condition of its provisions, and to be satisfied it must know that its meat is made from heathy animals. In general, the objection to corn in this respect holds only when it is fed as an exclusive feed, and may not obtain in all cases, and then only in an indirect way. In the natural state hogs are omnivorous feeders and the natural method should be followed as far as possible. When confined to a single nutrient, the appetite diminshes and the animals may become "off feed;" in this condition they are more likely to succumb to exposure or to disease. On the contrary, when a variety is fed the appetite is kept keen, the condition of the animal is better and his ability to resist disease greater.

The effect on the economy of the ration should be considered for the same reason that feeders can no longer afford to lose animals unnecessarily. Land is everywhere increasing in value and live stock raising is constantly becoming more expensive. This is especially true as relates to the hog industry, because hogs are raised most abundantly in those sections where land is the most expensive. Although corn is abundant in those States, it is relatively high priced and suplementary feeds such as mill feeds and commercial by-products are also more expensive than formerly. To meet this condition, feeders must resort to the methods used by large manufacturers and strive to get the highest possible amount of efficiency for the materials used.

There should be a minimum of waste. The hog requires less feed for a given amount of grain, and makes larger gains in a given time when a variety is given than when corn alone is fed. He will probably eat more in a day but other things being equal the heavy feeders are always the economical ones.

The effect of varied rations on the carcass will increase in importance as competition becomes keener and production more expensive. There is not yet the attention paid to this point in this country that there is in other parts of the world, but there is little doubt that eventually the subject will receive a great deal more attention.

In the countries where the effect of feed on the quality of the meat produced has been given the greatest amount of study, corn is regarded as injurious feed. In Denmark and Canada, packers have found that the more it is fed the greater is the tendency for the bacon to be soft. The markets of those countries demand a firm bacon that does not carry more than a certain amount of fat. Investigators have found that this softness in corn-fed pork is due to the amount of olein present, a fat which is fluid at ordinary temperatures. Olein is found in large amounts in corn and when corn is fed this fat is found in the fat of the pork. When feeds are combined with corn, whose olein content is low and whose content of solid fats is relatively high, the pork produced is much finer. Some authorities assert that corn should not be fed at all if the finest quality of pork is to be produced, but Canadian investigators have recently shown that when fed with skim milk, corn will produce as firm pork as other grains, especially if a garin which produces firm pork is fed in addiiton.

Other topics might be taken up which have a bearing on the relation of the corn crop to the hog industry and the best means of utilizing it. The effect of feed on the carcass and the use of roots, are among those subjects whose discussion could be handled appropriately, but this would occupy too great an amount of your time. There is little doubt that the time is rapidly aproaching when the greatest possible economy will be necessary in feeding. As corn is the great cereal crop of the country, and as it will in all probability continue to be the basis of fattening rations, feeders may well study carefully the best means of feeding it economically and to produce the highest quality of pork.

In the discussion of the subject of Mr. Wilson's paper Mr. Turner said:

"I would like to ask if any of the breeders here have ever used whey in their feeding. When I was a boy I lived in a dairying country where every farmer made cheese and every farmer raised a few hogs and fed very little of anything but whey. Since farming for myself I have had no opportunity to try this but I know that a good many men think whey not worth any more than water and I would like to hear the experience of any one in the audience who has had experience with it. At home the pigs were fed all the whey we could get and very little other feed and finished off in the fall with corn. I feel it is recommended by Secretary Wilson."

To this Prof. C. E. Curtiss of Ames, replied:

"We have used some whey at the college but not much. It has been used in feeding experiments and with very good results although it naturally has less feeding quality than either skim milk or butter milk because of the fact that we have taken out of it not only the butter fat but the milk sugar as well. But it gives very good results when fed with corn."

Another gentleman asked the value of buttermilk from cream that has been pastuerized before churning to which Mr. Curtiss answered:

"I do not know of any exact records upon that subject in which a direct comparison has been made between pastuerized milk and that which has not been pastuerized. So far as I know the buttermilk from pastuerized cream has substantially the same value as unpastuerized. It is held by physicians that pastuerized milk is practically as digestible for the human as the unpastuerized. There may be a slight difference in favor of the unpastuerized provided it is in a perfectly wholesome condition, but it does not materially affect the digestibility of the by-products of either milk or cream. The value per barrel would depend upon the price of other feed stuffs and the price of pork but I think successful feeders are able to realize from fifteen to twenty-five cents per hundred pounds from buttermilk in feeding fattening hogs or young and growing pigs. Twenty-five cents is rather above normal. Fifteen cents is perhaps the figure at which it is most common but it often gives a higher net rate than that per hundred when intelligently used. Practical hog men realize that buttermilk should be fed sparingly to brood sows suckling litters and to the litters when young. If used with caution and the pigs are started on it very moderately you might start them as early as three weeks old but I think it should never be used earlier than that. We have used it at the college at as early an age as three weeks with satisfactory results."

Mr. Curtiss' paper on the "Science of Feeding" was a particuly interesting one and read as follows.

THE SCIENCE OF FEEDING.

PROF. C. E. CURTISS, AMES, IOWA.

To the minds of some the term scientific in connection with agriculture suggests theory based on speculative or visionary doctrine. This conception is erroneous. Science is merely the correct interpretation of nature's laws. Scientific feeding is only the most natural and correct method, economy, efficiency and results considered. In discussing the subject to-day I shall not deal with the intricate and technical phases of the subject, so much as with some general principles and practices which I wish to emphasize.

The hog is preeminently the most profitable corn and grain condensing animal on the American farm. No other domestic animal is capable of converting so large a part of the feed it consumes into edible meat and no other animal yields so large a percentage of dressed meat to live weight. The hog will make from twelve to fifteen pounds of pork, live weight, from a bushel of corn; the sheep from five to eight, and the steer from four to five. The sheep will kill from fifty to sixty per cent of net meat; the steer from fifty-five to sixty-five per cent and the hog from seventy-five to eighty-five per cent. As an oconomical meat producer the hog has no rival. Viewed as a machine for converting farm feed stuffs into finished products the hog stands preeminent. He is even called upon to supplement and complete the process of converting feed into pork in the feeding of nearly all other stock on the farm. Eliminate the hog's part in the economy of farm feeding operations and you will remove the factor of profit in many cases.

The oustanding and ever present menace in hog raising is disease. Were it not for this, pork production at the prevailing prices would be an easy road to wealth. As it is, successful hog raisers seldom remain long in debt. One of the shrewdest bankers I have ever known rated his customers largely by their ability to raise hogs. A farmer who turned off a good bunch of hogs each year could always get credit at that bank.

The hog's ailments are numerous though not formidable, with the exception of cholera. For this there is no specific, or care. There are always venders seeking to exploit cocksure remedies at the feeders' expense. A really successful remedy needs no exploiting in the farmers' feed lot. The dealer who is honestly confident that he has a sure cure can well afford to provide his own hogs for demonstration. That artificial condition and feeding are largely responsible for swine diseases is generally admitted. Corn, the crop that makes pork production so highly profitable, at the same time renders the business extremely hazardous. Yet it cannot be said that there is any direct connection between corn and cholera or that hogs raised without corn would be immune. The methods attending the use of corn are largely responsible for disease. While no exact statistics that I know of are available there is generally a well established relation between the price of corn and the prevalence of cholera. I am fully convinced that the hog until the finishing or fattening period begins, needs more room, more freedom, more grass and succulent feed, and less confinement and corn. Because the hog utilizes grain products so efficiently and economically the mistake of feeding grain exclusively is too frequently made. The hog from first to last is capable of getting a large part of its feed from grass. During the growing period grazing is especially important and conducive to health and profit. A practical and scientific system of feeding should provide for an ample supply of succulent pasture grasses and forage crops for hogs throughout the spring and summer and autumn months. Combined with this the system of management should enforce exercise. The entire farm, or as much of it as possible, should be fenced for hogs. Three pounds of rape and five pounds of clover seed per acre sown with the small grain corp will afford an abundance of good feed on the stubble fields after harvest, at a merely nominal cost. The utilization of this feed for grazing hogs or sheep often affords more profit than the crop of grain. As high as $10.00 per acre has been obtained by Iowa farmers from the rape and clover aftermath following a crop of small grain in the manner indicated. Western lambs or yearlings can be finished for market by this method without grain. This crop is equally valuable for finishing hogs, or growing pigs.

The old time pigsty should be banished forever. There is no place for it on the modern farm. It has given the hog his reputation for filth. They are breeders of disease.

Even the permanent or central hog barn is of questionable value. The same money invested in movable hog houses and hog fences about the fields, will give much better returns for all purposes, except for fattening hogs, and farrowing sows, and the larger buildings are not necessary even for fattening. The movable houses permit the brood sows and pigs to be moved out into the ideal surroundings afforded by a clean pasture or a clover or alfalfa lot. They make it possible to distribute the hogs over the farm in clean, fresh quarters thereby utilizing grass and forage crops to the largest degree, and at the same time reducing the danger of disease to a minimum. They favor economical production. They promote the health and thrift of the herd and insure greater fecundity and more profitable feeding and more profitable breeding qualities. Thirty-five sows of different breeds on the college farm farrowed three hundred and twelve pigs during the present season and raised two hundred and eighty to weaning time.

According to the last census there are 229,000 farms in Iowa. It is a moderate estimate to say that there is on an average an acre of unused feed lots on each farm throughout the State. These lots almost invariably lie idle. Experiments conducted at the experiment stations show that an acre of rape has a feeding value equivalent to the production of five hundred pounds of pork. If we calculate this for the number of farms in Iowa and rate pork at four cents a pound, we have a product amounting to over $4.500.000 annually that might be realized from idle ground at almost no appreciable expense. An acre of alfalfa is even more valuable than an acre of rape for grazing hogs though it cannot be grown as a catch crop for a single season. On the college farm we sowed some ground adjoining the hog yards to alfalfa last August and I think we have had the best returns from it of any crop we have ever grown for hogs. We expect to largely increase the acreage of alfalfa on the college farm during the present season. In a blue-grass pasture we have pastured thirty-six prospective show barrows since the first of May. These hogs have had no grain whatever since the date named, yet they are in excellent condition, and growing though making but little if any increase in weight. The principle which I wish to emphasize in feeding hogs, is that in order to insure the best health, vigor, fecundity and profit in hog raising the herd should be handled as largely as possible in the open field and pasture and that during a period of six or seven months of the year alfalfa, clover, rape and other forage crops should constitute an important adjunct to the grain ration and at times the green fields may furnish even the major part of the ration with marked advantage and profit.

Following Mr. Curtiss' paper a number of questions were asked by different breeders concerning alfalfa and clover and their use as a balancing ration with corn. Mr. Curtiss answered these questions in a little additional talk in which he said: "The question of the possibility of balancing a corn ration with clover or alfalfa or other crops of that character instead of the grain crops or by-products from the factories was one of the central thoughts of my paper although I did not go into all phases of it and make all parts clear; but that is one of the very first advantages. These products which we have used as balancing rations with corn are becoming more expensive every year. Back about ten or twelve years, in 1892 and 1893, we were buying gluten feed at thirteen dollars, f. o. b., at Ames; today it costs from eighteen to twenty-two dollars and frequently higher than that, and you all know that shorts have advanced in price in proportion and I believe that we can balance our corn ration much more economically and to better advantage with good pasture during the summer, spring and autumn that we can by using the grain and factory by-products, which are so much more expensive. Of course we can not substitute pasture entirely, for the young pigs especially. We must use some nitrogenous foods but to a much less extent if we have the right kind of pasture and forage crops. I think there are but few localities in Iowa where alfalfa can not be raised and will not be in the near future. I believe that if we had no more rain in the fall than some of the regions further west where they grow it and if we had the same incentive as they, we would have success with it. At the same time, I do not believe that it is as easy to get alfalfa established here, but if we come to study it more and if more men will put their knowledge to work we will increase the area of alfalfa. The best alfalfa we have ever grown on the college farm is grown on clay soil. I think you can grow alfalfa as well on clay as other soil. While on this subject I would like to say that for the past two seasons we have been sowing alfalfa in August, sowing a crop of small grain with it, and while it may not hold good invariably, we have had best results thus far in sowing in August. We aim to get it in in good condition the middle or latter part of August and with a fair amount of rain and good conditions it will make a growth of from six inches to a foot before fall. The advantage is that you do not lose the whole season. Alfalfa which we put in last year has given excellent results and we had a strong, vigorous crop this season and expect to put in more. A hard winter will kill out alfalfa and we will lose a crop occasionally but it is worth all the effort and all the cost that is necessary to get a crop of alfalfa established and especially about the buildings where you can use it as pasture for hogs. I consider alfalfa very much better than blue-grass. One acre of alfalfa amounts to fully three acres of blue-grass as pasture for hogs. At this time of the year there would not be so much difference but alfalfa keeps growing and does not die down. We have tried sowing alfalfa when we lay the corn by but I do not know whether it will prove a success. It has not with us, and I am inclined to thing that it will not. We always get the best results without a nurse crop. You want to get the soil in the best possible condition, make a fine seed bed and then sow liberally. We sow as a rule twenty-five pounds to the acre. I think alfalfa can be grown on the soil of practically all parts of Iowa, on timber or prairie soil. We have grown as good alfalfa on timber clay soil and high bluffs as ever any where."

Mr. Munson gave his plan for pasturing hogs which seems to be a very good one. He said, "On the 28th of March I sowed oats and rape on one of my six small hog pastures. In three or four weeks I sowed another and so on, sowing a new patch every two or three weeks. The fore part of May I turned a hundred and five pigs and twelve sows into the first patch. In about three weeks I take them off that and put them on the second patch. By the time I get to the last patch the first one is again ready for pasture. The old stuff can get a living on the pasture. The young pigs get a portion of corn meal. In feeding corn meal you save five per cent of the feed by grinding. I mix the feed into a mush, not slop, so it will not run and feed all they want of it and then take it away. Then I give them milk, and a good warm separator milk beats it all, and the pigs gain. Without the green feed I would not advise feeding very much corn to a young animal unless feeding for show."

In answer to a question by one of the gentleman as to inoculation of the soil Prof. Curtiss said: "About the best thing we have found to inoculate with is to have good soil and inoculate with barn yard manure and good cultivation. There are cases when inoculation will prove of good benefit but if you have first class soil and good conditions you do not need inoculation. It is important also when you are starting to fit a piece of ground to alfalfa to have it in a fine state of fertility. You will stand better chances of making alfalfa grow if you will put it in the best soil you have. Alfalfa will often fail on a piece of soil in poor condition when if you will manure that soil well your alfalfa will be a complete success and you need not give yourself any uneasiness about the condition of your soil or inoculation if your soil will grow seventy-five or one hundred bushels of corn per acre."

Some one asked if alfalfa is any more liable to winter kill if it has been grown four or five years than the first year and also when it is safe to pasture, and Mr. Curtiss said: "I do not know that it is less likely to winter kill if you get it well started the first year. If you have sufficient rain fall, your ground in good condition and get a good growth the first season, I believe it will go through the first year about as well as any time. I think it is generally conceded that it should not be pastured very closely too early

I do not think it is safe to pasture alfalfa quite as close as clover and in order to guard against loss of crop it is well to avoid pasturing too closely."

"What do you think of manure as protection against freezing out?" was another question which Mr. Curtiss answered: "I think that strong alfalfa in good condition will do about as well without manure as with it. It would be better to have the protection in another way. Apply the manure before you put the alfalfa in and get a strong growth, avoid close pasture and risk that for protection."

The subject of rape was brought up and one gentleman said: "I would like to hear the experience of some of the breeders with growing rape. I sowed rape in oats one year and by the time the oats was ripe the rape was above the oats. Another year I had a patch of rape and I had two sows with eight pigs that I wanted to give an extra chance. I turned them into the rape and they got mange and were the poorest I ever had." Prof. Curtiss replied: "I have heard some complaint about rape getting up so high as to interfer with the crop. Some advise sowing three weeks after the grain crop. We have had no difficulty sowing at the same time. We have tried it and followed that practice and never have been troubled although I know there is some complaint. One thing to guard against is pasturing it with young pigs when you have a rank, vigorous growth or when it is wet. If you have a heavy growth of anything and turn pigs into it when it is wet you will have difficulty. Practical experienced hog men know it does not do to have pigs run through wet pasture."

Mr. Turner asked Prof. Curtiss if alfalfa would winter kill if grown on sloughs that are tiled out and Mr. Curtiss said: "You must have surface drainage in addition to subteranean drainage because when the ground is frozen the water standing there in the winter will kill the alfalfa. If you have a bottom ground that is sloping so as to guard against that, I think you can grow it successfully. We are growing it upon bottom land."

Mr. H. Woods Robinson, of Clay, Robinson and Co., Chicago read an interesting paper on "The Top Price Market Hog" which contained some information on the kind of hog the market demands which is of value to every pork producer. We give the paper in full.

THE TOP PRICE MARKET HOG.

H. WOODS ROBINSON, CHICAGO.

In a toast on "The Sow and Her Son" printed in the Breeder's Gazette, Col. F. M. Woods, the prince of Auctioneers, made the following statement: "There has been more improvement made in hog-breeding during the past twenty years than in any of our other domestic animals. It would seem that in quantity and shape perfection had been reached. The problem now is the scientific blending of the fat and the lean. A hog is a comical animal and like a man, stubborn. Josh Billings once said that the more he saw of men the better he liked hogs." To all of which facts every hog man will bear witness. The amount of improvement made possible in the hog by intelligent breeding and feeding is an object of wonder even to a close student of evolution. Even within the memory of the older men in this audience the hog was considered as the scavenger of the farm. He was born in filth, lived without any particular attention and died ignominiously when the pork barrel needed replenishing or the family purse became slender. "That nothing is too dirty for the hog" is an axiom still too frequently quoted and believed in by sadly misinformed persons. Let us not be misunderstood that this is the general condition of the modern hog, however, for it is probably safe to say that the majority of the seven million lusty porkers that every year see the light for the first time in Iowa know the benefits of good sanitation and proper feeding. It is only by such methods that the much despised porker of former generations can be made into the sleek-backed carcass which finds a demand in nearly every market of the world.

In the early days when cheap land and the seemingly inexhaustible fertility of the soil caused all farmers to become somewhat slack in their business methods, it looked like easy money to drive out into the timber lot and pick up a load of hogs. These hogs knew no pedigreed ancestry and were nondescripts in form and color, but at that time uniformity of type and color had little to do with the market demands. The uneducated appetites of that time did not demand a score of different cuts from each carcass, but simply divided the hog into side meat, ham and shoulders, using the odd pieces for sausage. I remember distinctly in 1853 or '54 my father buying from a Mr. Pfiefer for $100 the mast grown on one of his large Ohio pastures. My father turned in 300 hogs, and there was still so much mast going to waste that he put in another 200, thus fattening 500 hogs at a cost of $100. He then drove them to Cincinnati and sold them for $2.50 to $3.00 per cwt., making a nice profit. But at the present time when every foot of tillable land in the middle west is assuming an almost fabulous value the farmer must follow intensive methods of agriculture to their very limit, and in no way can he do so more profitably than by raising a class of hogs that will tickle the appetites of a dozen different people. The time for careless hog raising is gone never to return and only the man who produces the best type of porkers is the one who will be able to make his accounts balance on the right side.

With these facts in view let us consider some of the points which make a hog valuable on our present market. The great basis of market hog classification is that of weight and the desirable weight varies at different times of the year. Beginning about September first the heavy hog comes more into evidence and commands a premium over other grades. The heighth of the demand for fat-backs is reached in December, January and February, for in those months the great slaughter houses at every market center are packing thousands of hogs every day. The time was when nearly all hogs were marketed as heavy-weights, but now even in the winter months the demand for extreme weights is not so great as formerly. This can be largely attributed to an increasing consumption of fresh pork, and most of the fresh meat cuts can only be obtained from the lighter grades of hogs. Beginning about April first the light hog sells on a par with the larger grades and a month or so later the light-weights command a premium at every market. There is one system of hog management quite prevalent among farmers that seems to be in direct opposition to these market demands. Many hog raisers, and good ones at that, sell their eight-months old pigs in the winter at a weight of 250 lbs. and then, dispose of the old sows in the summer when they weigh around 400 lbs., thus bringing their light hogs on a heavy hog market and vice versa. However, the loss in such a system is rapidly becoming less as the demand for the extremely heavy hog grows smaller. A prime, well-finished hog weighing about 250 lbs. will generally land near the top and this may be said to be somewhere near the ideal market weight. We don't mean that this weight of hogs will top the market every day of the year, but prices on that class will average the best during a whole year.

I suppose every breeder wants to know what particular breed sells the best, and that is one of the hardest questions for a hog dealer to answer. Perhaps the best answer is that no breed enjoys any marked preference. In a recent investigation conducted in the cornbelt about seventy-three percent of the feeders replied that they preferred the Poland China for the feed-lot, giving the small bone and quick-maturing qualities of that breed as the reasons for their choice. Yet other men claim that those very qualities have been obtained at the cost of making the breed weak and non-prolific, and so this argument might extend without end. However, let it be understood that the packers make little or no distinction between any color or any breed. What they want is a smooth, even lot of well-finished hogs without regard to ancestry. Still there is little to be said in favor of the cross-bred hog. While we stated that practically no discrimination is made against any color, yet a spotted lot of hogs do not look as even as a load of uniform color and usually suffer as a consequence. You seldom see a picture of spotted or off-colored hogs that topped the market. About the only time when any certain color is demanded occurs with certain eastern shipping orders which specify the desire for black hogs, but this particular demand is too small to affect the market to any appreciable extent.

Now we hear somebody ask, "What about the bacon hog?" Let me say right here that the bacon hog will never worry the swine breeders of Iowa. The bacon type is not so much a product of heredity as it is a product of environment and particularly food. Here in Iowa where corn is king the bacon type will never reach any high grade of development, but will rather retrograde toward the lard hog form. On our American markets the Berkshire is preferred for a bacon hog, but this may be due to the fact that the other bacon types are but little known. The Tamworth, which had many ardent supporters a few years ago is gradually falling into oblivion, hog buyers objecting to the heavy bone and enormous head of that breed. Still in light hog season it is only fair to say that the Tamworth sells well in comparison with other breeds. Whatever the claims of the various breeders may be it still remains an established fact that the corn-fed hog is the only one which meets all market demands at the present time. A Detroit buyer who patronizes the Chicago market said that he came there because he couldn't get the desired quality anywhere else.

Volumes might be said and written on swine diseases but there is one ailment that deserves particular mention at this time, and that is swine tuberculosis. In most cases this plague is not discovered until the carcasses come under government inspection, and then the infected hogs have to be destroyed. Of course this throws the loss on the buyer, but many leading buyers say that such losses will soon be thrown back on the seller. This disease is said to be caused many times by feeding to hogs the bodies of old cows and horses that are already infected with tuberculosis. The dangers from swine tuberculosis can no doubt be greatly lessened if breeders and feeders will take the matter in hand at once. It is simply another case where the proper sanitary methods become absolutely necessary in profitable hog raising.

I personally think that the All Father was wise when he gave us hog cholera. If it were not for what most people call by that name reducing the surplus you would soon be selling hogs at $3.00 per cwt. Of course it is cold comfort for the man who loses the hogs to reflect that he is helping hold up the market for the benefit of his more fortunate brothers, but it is a Godsend to the men whose swine escape the plague.

Of course there are times when the prices of corn and pork do not seem to be in the proper ratio, but generally the hog raiser has little to complain of. Let every feeder tack his faith to one breed of hogs and then exert himself to produce the best pork that proper care and good feed will make possible. Then when he sends in a smooth, even load of hogs that come somewhere near conforming with the market demands for weight he will have little to complain of when his check is written. He will then perhaps enjoy that blissful state of existence so well portrayed in the little couplet often quoted by Col. Woods:

"A sow and a cow, and a good-laying hen
  Provide financial salvation for men.
And if in addition you have a good wife.
  There's nothing to hinder your enjoying life."

This paper was greatly appreciated by the members present and Mr. McTavish expressed himself as follows. "That paper covers the field so well that there seems nothing more to say but I would like to ask Mr. Robinson if two loads of hogs going to Chicago weigh two hundred pounds each and one load is thin and the other fat, which load will the packers prefer?" To this Mr. Robinson said, "As a rule the packers will prefer the fat hog. There are times when the light hog will outsell the fat hog but in the majority of cases, like other stock, if you send a good thick bunch of hogs properly fattened they wil sell toward the top of the market. Those that are thin do not get it."

Here Mr. Browning said: "I have had considerable experience in butchering different kinds of hogs and have given some thought and study to this feeding and fattening business. People think a thin hog is a bacon hog. It is not. The right kind of a bacon hog is one that is well fed and grown but not fat but he looks nice and sleek and has quality. Packers do not make as much distinction as they should. The bacon hog should be a nice smooth hog. You take a hog that weighs two hundred pounds of the bacon type and he will be thin boned, stand well on his feet and a better hog than a big eared, loosely built and big boned fat hog, and I think the great difference between the bacon type and the fat type is in the individual difference of the hog, and one reason why there is no particular call for bacon breeds is because there are enough individuals among the fat hog type to supply the demand for the bacon type of hog. For instance, we find among the Duroc Jerseys some hogs that look like the bacon type and then there are others of the same breed that are rather big boned and loosely built."

Mr. Munson expressed himself on this subject as follows: "My idea of this bacon hog business is this; that if you feed any hog on bacon feed it will be a bacon hog. Take any bacon breed and feed corn and you will have a corn fed hog. You can not produce good bacon in Iowa where we feed corn. When you feed corn you will not produce bone and muscle but fat."

Mr. Robinson agreed with this, saying, "I want to say that you are right. And why do you feed your hogs corn? Because they bring you more money than bacon hogs. That is what we raise the corn for."

Mr. Funk gave his thought on the bacon hog in these words: "I think there are two different breeds. The bacon hog is the hog that takes exercise; the fat hog is the hog that eats and lays down The bacon hog will eat his meal, take a run around the pasture and come back and eat again and so makes solid fat."

Mr. Munson asked how long it would take to make a bacon hog into a lard hog or a lard hog into a bacon hog, if you feed right, to which Prof. Curtiss answered, "It is easier to ask some of these questions than to answer them. I will say this, however, that all that has been said here in regard to feeding being the factor in determining the type of our hogs is strictly true. We produce in general in Iowa the fat hog because of the conditions under which it is produced being favorable to that type. At the same time, there is another type that is distinct and recognized as such and it is easier to change that type by breeding within a single generation or within two or three generations than it is by feeding. We have conducted some experiments along that line and while you can take a bacon hog and make him fat it is easier to change the type by breeding. If you take a car load of the fat type as pigs and feed them the best possible bacon ration that you can you can get them into the same form and about the degree of flesh so far as amount is concerned but will not make them bacon hogs of a high standard of excellence. The difference is this, that the bacon hog is a smooth, hard, fine boned hog; the other may be thin but his flesh will be soft and flabby. It is the result of both feeding and breeding, but breeding is a greater factor in fixing the type of a hog than feeding. I agree fully with what has been said in regard to the character of the hogs of this state always being of the fat type. It is necessarily so because our corn crop is the feed which we have in greatest abundance and we are producing more largely the kind of pork that can be produced easily with corn. However, there is a great demand for bacon hogs. There is a firm at Ottumwa which imported several hundred breeding hogs of the bacon type and markets are paying them a premium for that kind of hogs. They make a specialty of it. About a year ago I was talking with the manager of the firm and he told me that they were feeding hogs two or three weeks before killing on shorts and buttermilk. How much they gain in two weeks feeding I do not know but that firm is putting out a very high grade product and our local meat merchants have said they can take hams bought of this firm and sell them for more money than hams that come from Chicago. If these men get a premium for their products the farmers can get it for the same class of goods."

Mr. H. F. Hoffman, of Washta, Iowa, read a paper on "Health on the Hog Farm" which was not very interesting but instructive.

HEALTH ON THE HOG FARM.

H. F. HOFFMAN, WASHTA, IOWA.

This very important subject is perhaps receiving more attention at this time than ever before, and justly so.

Our first impression upon being asked to write a paper along this line was that it was meant to be confined to the conditions that were to prevail on the farm after the birth of the pig. But to really have health on the hog farm it is necessary to get busy long before this time. As many pigs are born, and we might almost say the majority, with constitutions so warped and organic weakness so pronounced that no amount of sanitation would ever make a vigorous, or what we might call a healthy animal. These in turn are called upon to reproduce, with the result that their constitutional defects are transmitted indefinitely and their power of resistance is so slight they are an easy prey to about all the ailments the hog is heir to and are handicapped from life.

To have health on the hog farm the first essential is healthy stock to produce them. Therefore in their selection we should keep this point in view and use those with the fewest weak points possible and that are well matured. Any deviation from this should be the exception and not the rule.

With the above class of breeding stock as a foundation we should get strong, healthy pigs, and will if the proper food and care is given from mating to farrowing time.

We are aware the future usefulness and health depends largely on this period, but as we are to have papers bearing directly on this phase of the business as well as the food problem, we will pass it by; besides if we were to enter in and wade through the details connected therewith we would likely not reach the farm before the next June meeting, so will take it for granted the pig is born physically strong.

The first thing he needs is clean, well disinfected quarters. If he is born and compelled to pass the first few hours of his life in a foul pen, no matter how strong he may be, he is quite liable to take up poisons through the navel and if it does not cause his death before he is a week old will prove a serious set back for all time. Therefore, keep the quarters clean of filth, take it to the fields where it becomes food for the crops instead of poison to the hogs, and use disinfectants freely, not only in the farrowing pen but in all the pens, yards, feeding places or anywhere it seems necessary. It is not much work and the cash outlay is next to nothing. There are quite a list of commercials on the market, some of which we know are good and probably all of them, but here are three, while they are not as aristocratic, will do the work and do it well: Sunbeams, crude carbolic acid and air slacked lime, and we can see no reason why they are not used more extensively unless it is because they are so cheap.

As to the general health conditions, we cannot do better than quote the words of an eminent French physician on his death bed: "I go but leave behind me three great physicians: pure air, pure food and pure water." We can have all of these and as a rule in abundance. Pure air by giving the buildings good ventilation and keeping them and their surroundings clean and using disinfectants to destroy any foul odor that may remain. As to pure food, our grains and forage plants as they are delivered to us from the hand of the Creator must be well up to the standard of purity if we can preserve them in this condition and not allow them to become musty or sour and feed them in a clean place, we have pretty much solved the pure food problem. Pure water, by using nothing but well or spring water that we know, or have good reason to believe, is pure. And in using hog waterers clean both drinking part and barrel often and dropping a small piece of quick lime each time helps to keep the water pure. Some think a creek the proper thing, and there may be those that are, but we believe ordinarily they are among the most expensive of water systems.

Cleanliness, as everyone knows, is conducive to health. Therefore, we should observe it about the premises. Strange as it may seem, we have actually read articles in the swine journals since the beginning of the twentieth century, defending the old time mud and water wallow, the retreat of about all the enemies of health, an unsightly, excuseless nuisance that would not be tolerated for a day by any sane board of health. Instead, give them shady retreats through the summer with good pastures of as great a variety of grass as possible, dig two or three pits close together and keep the corn cobs gathered up and transform into charcoal. It will surprise anyone who has never tried it to see how much they will eat of it. Keep a box of salt where they can eat at will. We do not approve of feeding salt and ashes mixed but feed each by itself.

To keep pigs healthy they must have exercise. Therefore, we must see that they get it by feeding through the summer weather about nine o'clock morning an evening. They soon form the habit of working the pastures for two or three hours at each end of the day while it is cool. Have a regular time to feed and you can depend on the pigs being there promptly on time. If they are not over fed on grain they will take daily exercise and as a rule keep healthy during the summer months. But as September goes by, or not later than the advent of October, conditions have changed, a fact not to be lost sight of as we believe more pigs go wrong at this time than any other. Some of them that have been doing well now begin to show a staring coat and do not come to their meals as briskly as usual. We hear a cough and soon some are absent from the trough altogether. We find them lying down, the breathing is jerky, and they have a decidedly pessimistic appearance. Like as not, in a few days we find a dead one and more of them off their feed. Ordinarily the owner makes a hasty diagnosis of the situation and concludes they have cholera brought on by feeding new corn and begins treatment by feeding some cholera remedy with the result conditions grow worse instead of better. What we ought to do in all such cases is to cast about and locate the cause and get at work to remove it instead of doctoring effects. In most of these cases the cause is not difficult to find.

Go through the country in the month of October (which is the connecting link between warm and cold weather) and we will find on nine out of ten farms summer conditions yet prevailing. The pigs have been in the habit of sleeping on a warm soil scraping together leaves, corn husks or most anything to make a soft comfortable bed and prefer this to going in the pens and lying on the hard board floor, with the result that they become chilled through. On cool frosty nights they squeal, pile up, steam and take cold; then the trouble begins. We have made a post mortem of many of these victims and never failed to find the seat of trouble in the lungs. To prevent this, clean the pens and put in an extra amount of bedding and thereby make it an inducement for them to sleep there. If they are obstinate about it, feed them there and shut them in until they will go voluntarily and a lot of trouble will be avoided and we will escape at least one of the many charges wrongfully preferred.

We do not wish to throw anyone into hysterics, but will make the statement that corn is one of the most, if not the most, palatable, and when mixed with a little good common sense, the most healthful of any one grain for the hog.

Many people have a theory that health and drugs are inseparable or at least have a sort of affinity; a theory as groundless as ridiculous. It is a demonstrated fact that the person who uses the least drugs enjoys the best health, and this is equally applicable to the hog.

There are several things in this connection we should remember. First, a healthy hog needs no medicine; next, when he is sick or off feed it is not what we put in his stomach that counts but what we keep out of it. Give him a good dose of starvation and let the stomach evacuate, thereby giving nature a much better chance to get in her work, which is to build up.

Health is natural, disease unnatural; the former is contagious as well as the latter. In the fight between the two if we will give nature a little solid encouragement she can in most cases be depended upon to come off victorious.

We do not care to go on record as saying, give no medicine under any circumstances, but we do protest against its indiscriminate use and are strong in the belief more injury results than benefit. And we also believe if the money spent each year for drugs, stock foods and sure cures generally, were employed in the construction of more comfortable buildings, better pastures or a more sanitary water supply the general health level would be higher and our farms present a better appearance.

As we have already said, we would leave feeds out at this time but in conclusion will say a word as to the manner of feeding, which should be with regularity and if there is a clean place on the farm use it if possible. The mud is not a good feeding place, dust is worse; both should be avoided as far as possible. Any changes to be made whether is quantity or kind should be gradual with an eye open for results.

After all it is no more our mission to keep our hogs healthy than to allow them to keep themselves so; consequently we should keep them close company, study their habits and requirements, then cater to them. Couple with this humane treatment and we will in the main have health on the hog farm.

In answer to some questions from the breeders as to how he used the lime and carbolic acid Mr. Hoffman said:

"I use the air slacked lime when it is wet. The lime has a tendency to dry out the hog house. When it is dry I use carbolic acid. I never have been particular about the strength of it. It is very cheap, forty cents a gallon. I take a barrel of water and pour in some carbolic acid. You can use a good deal of it with no fear of getting too much."

Some one asked the symptoms of worms and what to do for them and Mr. Munson gave his plan as follows:

"When I think my pigs have worms I take them off feed at night, even water. The next morning I mix up a good dose of feed and turpentine. In the evening you will see results. If that does not do give another dose. When they get in that condition they will cough and their coats get rough and they do not eat well." Mr. Hoffman suggested that santonin had been recommended to him as a remedy for worms.

Here Mr. Trigg again brought up the subject of Alfalfa. He said:

"The average Iowa hog is poorly fed. He is fed too much fat. If proper fat is given him many of these troubles could be removed and I want to offer this suggestion. It has been proven beyond question, because the evidence is all over the state, that it is possible to raise at least two, three or four acres of alfalfa on most of our Iowa farms. If you have an acre of alfalfa, you can then give your hogs an almost perfectly balanced ration during their growing time. Put your land in the very best condition, sow about twenty pounds of alfalfa to the acre and use that for a hog pasture. Some are doing this in this state with the best results and it is a practical thing to do."

Harvey Johnson, of Logan, Iowa, was unable to be present but sent his paper on "The Breeders' Outlook" which was read by the Secretary.

THE BREEDERS' OUTLOOK.

HARVEY JOHNSON, LOGAN, IOWA.

We are all looking forward. It is a natural condition. The man who is continually looking back over the past cannot advance.

There has been implanted in the life of every man an anxiety as to what the future may have in store for him. From the very childhood of our race this has been a marked characteristic. In the young man, in the morning of life, it is most apparent. All want to succeed and all likewise shrink at the thought of failure.

Ambition, well cultivated and based on good principles, directed by good judgment and sound sense, should be found in every man's life. Where it is not, we do not expect much.

As a company of breeders, we want to succeed. We earnestly talk with each other about the present outlook, the supply, the future demand, and at what prices. We notice with intense interest the various conditions that arise that have a direct bearing on our line of business, and because of this interest we are better prepared to meet these conditions when they do come.

I have scanned carefully the horizon of our business, and I fail to find any clouds sufficiently large to cause us present anxiety. Present conditions are good and future prospects are bright.

After having spent almost a quarter of a century actively engaged in the production of pork, I can truthfully say that I do not recall a time in which the future prospects of our business were brighter than they are at the present. President Roosevelt is doing all he can to bring about a change in conditions that have been working an injury to us, and, irrespective of politics, we should unite in thanking him for what he has already done and for what he will do for us in the future, and would say to him that even the heart of a hog-man can be moved with admiration for a man who has the courage to demand that justice and fair play shall be accorded to each and every one alike. May he succeed in what he has set out to do; and likewise, may every hog man receive the punishment due him if he fails to be grateful for the services rendered and for the benefits received.

There is no indication that there will be a decrease in the demand for pork. Our foreign market is constantly broadening and enlarging, and the amount consumed at home will not be less. The natural increase of our own population and the immense number of foreigners coming to us each year, who will be a meat consuming rather than a meat producing class, are all healthy indications that there will be a good demand for all our produce.

In the pure bred department of our business, prospects are also very encouraging. The pig crop is fairly good and herds are in good health, —our state having been remarkably free from disease for some time. There is an increasing demand for our stock. Farmers and stockmen are appreciating the value of good blood and are becoming customers. The storm of boom sales and ficticious prices and its accompanying evils has about passed over, and may it never return again to curse our business. Next, may the speculator either become a straight breeder, or step out of the business, and his place does not need to be filled.

In no other line of business does confidence in man play a more important part than it does in ours. Purchasers of horses or cattle usually buy only after a personal inspection, but four-fiths of our sales are made through correspondence; hence the great need that we be both careful and truthful, or we not only injure ourselves, but we cast a suspicion upon all other breeders and do the business in general a great injury.

The question is often asked: "Are there not so many men engaging in the business that there will be an over production, and we cannot find sale for all our stock?" I have no fear in that direction. It may compel us to raise our standard and sell more of our poorer grades on the market, which would be a good thing for both us and the business.

Many of the old breeders are dropping out of the business, making more room for young men. Twenty years from now only a few of the men that are today producing the thorough-bred stock of our state will be actively engaged in the work, and if the work is carried on, it must be done by those that are today boys and young men, and this being true, how essential that they should begin preparing for it.

Our state has a place for and offers excellent inducements to thousands of young men. She wants them to prepare themselves to become her scientific farmers and stockmen of the future, and she wants them to be at least one grade in advance of those of the present day. She tells them in plain language that, if properly managed, she can produce twice as much grain as at the present time, and that her herds of live stock can be larger and of better quality. She does not promise fabulous wealth, but she does offer a competency and that at a much less risk than will be found in many other lines of business.

Our state is anxious to retain her place as the best state in the Union, and to this end she will require more of her assistants in the future than she has done in the past. She wants the young men who will soon apply for the positions of farmers and stockmen, to be able to show certificates of industry and ambition, good health and good character. She wants them to take a deep interest in their work and a pride in their surroundings. She wants them to have a good knowledge of the principles she teaches and to use them in their work, and to those who do this, she will give ample reward. To be a scientific farmer and stockman in the state of Iowa is a most laudable ambition for any young man. I know of no better occupation, nor one that I can as heartily recommend. In it are ample opportunities for the development of all faculties that go to make up a well rounded man.

So while the outlook for us is good, the outlook for those who are to follow us is still better.

There were no discussions on Mr. Johnson's paper and following it the Secretary read the paper on "Care of the Brood Sow and Litter", by L. C. Reese, of Prescott, who was also unable to attend the meeting.

CARE OF THE BROOD SOW AND LITTER.

L. C. REESE. PRESCOTT, IOWA.

The first and most important thing is to have good sows bred to a well mated boar of good breeding for your foundation herd. Start right, then care for them in the proper way.

The second thing for us to do is to have a well ventilated dry place, with plenty of good straw for the brood sows to sleep on, and change the bedding at least once a week and do not allow them to pile up on top of one another.

Use good judgment in feeding, giving them a variety of grain such as oats, barley, wheat, rye, and speltz; which I think is the best food of all mixed with shorts for brood sows, and above all do not feed to much corn as it is too fattening and the brood sow needs muscle and bone producing feed with plenty of exercise and, to my opinion, the best way for exercising is to have your farm fenced hog tight and let the sows follow the cattle and pick up the dropping and waste corn left in the field at husking time. You will be surprised how much better the sows will do, and how soon you will pay for the woven wire in the feed you will save, and I will be glad to see the day when we are all compelled to fence our farms hog tight.

After wintering your sows, begin shutting separate about two weeks before farrowing time in a good warm pace where the rain and snow will not blow in on them, giving plenty of oats and water. After farrowing never give slop of any kind until the pigs are forty-eight hours old, just plenty of water, then be careful not to feed or slop too freely for a few days or your pigs will scour. If they do, give dam a tablespoon of Venetian red in slop once a day and the pigs will soon be all right; or turn the little fellows out to eat dry dirt. When the pigs are two weeks old fix them a place where they can eat by themselves and you will be surprised how much the little fellows will eat.

Have your sows to farrow as near the same time as possible, for if you do not the older pigs will rob the younger ones, and you will be sure to have a lot of runts to contend with and you all know it is much nicer to have an even bunch of pigs than all sizes. Even if you are feeding them all they will eat, the larger ones will crowd the smaller ones away and they are sure not to thrive.

Now a word in regard to feed for the mother and her pigs. The best feed I have used is a mixture of corn, oats, and wheat or speltz equal parts, with one-sixth weight of above mixture oil meal, and give the pigs all they will eat, but do not feed their mothers too much. Give plenty of skimmed milk, and have good pasture for them and at weaning time add a little more corn. I think three and one-half months about the right age to wean them. But only take the larger ones off at first and let the smaller ones run a week or two longer and the sow's udder will not cake. After pigs are weaned you should watch them constantly and see that their bowels are in good shape. If you find they are costive, feed about one-fourth pound of hyposulphite of soda to forty pigs once a day for a week, or until bowels seem loose enough. There is not much danger of this if your pigs are running out on good pasture, having plenty of exercise.

I think it is necessary to dip hogs once a month to keep their skin in good condition and destroy lice as it is very injurious, especially to the little pigs, to be lousy, and also to keep off diseases.

Be sure to watch your hogs at all times. I find it a good plan to keep air slacked lime and saltpetre before your hogs at all time. If your pigs commence to cough and you are afraid of cholera, I will give you the receipt that was given at the National Swine Breeders' Convention, and several tried it and said it had never failed:

5 lbs. Copperas.
5 lbs. Black Antimony.
5 lbs. Sulphur.
5 lbs. Epsom Salts.
1-2 bu. Oil Meal.
1-2 bu. Wood Ashes.
1-2 bu. Salt.
1-2 bu. Slack Lime.

Mix and feed all you can get them to eat. But since I have learned by sad misfortune to not burn my hogs up with corn, and feed more muscle producing feed, I have not had hog cholera. But we never know when our herd may be destroyed and should use all precaution possible. So it is well to be prepared at all times.

When pigs are six months old, pick out the sows you expect to keep for your next year's herd, and do not feed them too heavy. But the ones you expect to sell, feed all they will eat of corn, oats, barley, and other muscle producing feed, but do not throw it in the mud and expect them to thrive. I find you will save enough feed in one year to build a platform that will last for years if built properly. At present prices of lumber, a cement and stone floor is cheaper and better, but do not use brick as the hogs will destroy it. My reasons for feeding sale stuff all they will eat is because three-fourths of the buyers will pick out the nice blocky fat ones, even if they have defects, rather than pick on one in thin flesh, no matter how perfect he may be. This is a great mistake too many make. Consequently we will have to put on the fat to please the demand.

There is one thing I had almost forgotten to mention, about marking your pigs. I think it is important that every breeder who is breeding hogs for breeding purposes, mark their pigs before they are thirty-six hours old, as I do not think any man has the ability to keep the record of all his pigs if not marked, even if he only has several litters. It is impossible. I would not buy a pig of any man that did not mark all his pigs, and would advise others to do the same as I think it very important that we should be very careful. The best way I have ever found to mark pigs is to let one notch in right ear represent one and each notch in left represent three, consequently you can keep track very nicely. For example, one notch in right ear represents first litter, two notches in right ear second litter, one notch in left ear third litter, one notch in each ear fourth litter and so on, as three and one are four. If you will come to my place at Prescott ,Iowa, and I should not be at home, Mrs. Reese or the hired man can take my books and tell what every little Chester White's mother is, and what they are sired by. I always try to please all my customers by giving them the right kind at living prices. I believe in honest dealing. "Do unto others as you would have them do unto you."

At the close of this paper Dr. Hammer said: "This brings up the idea of marking pigs. We have a way of marking our pigs which we have tried for four or five years and for the benefit of some who would like to understand a simple way of marking pigs I will give it. It can be done with only three marks in each ear. We do the marking with snippers. For the first litter cut one mark in the upper part of the right ear, second litter, one mark in the middle of right ear, third litter one mark in lower part of right ear, fourth litter upper part of left ear, fifth litter middle part of left ear and sixth litter lower part of left ear. You want to cut as little as you can." Dr. Hammer continued the manner of marking up the thirteenth litter and said, "We can mark twenty litters so, with no more than three small cuts and we have found it a very nice and easy way."

Mr. Turner continued on this subject, saying: "I have marked our hogs for many years in accordance with Mr. Reese's plan only his checks do not go far enough. If you make your marks in a certain part of the ear, it is sometimes hard, as the pig is likely to slip away and you miss. I can mark a hundred litters and have them all different with the system which Mr. Reese gives only you have to carry it out a little further. We have not the least trouble in identifying any litter up to thirty or forty or fifty litters. Of course it does cut a good deal. You will have three marks in the left ear but no more than two in the right. One mark in right ear represents first litter, two marks in right ear second, one mark in left ear third and so on. Three marks in left ear represents ninth litter. When we come to ten we put one mark in upper part of right ear and for twenty, two marks and for thirty, one mark in upper part of left ear. We can mark ninety nine litters and not have any two alike."

Concerning the care of the sow Mr. Munson said: "There are a few things in the paper that I do not agree with. On some lines I may be wrong but I believe there are lots of times if we let the hog have her way and use a little sense with it that the hog and man both will be better off. I have heard time and again never to feed a sow until after forty-eight hours. I think that is foolish. After farrowing time if my sow asks me for food if it is only two hours after, she gets it because she knows better than I do if she needs it, but I use judgment in feeding. I think, also, that one important thing which many overlook is, to cut the pigs tushes as soon as possible. I do not believe there is anything like cankers. I have never had a case of sore mouth on my place when I cut the tushes. The canker gets in when they hurt each other. For this my remedy has been to cut their tushes and I have no trouble."

On this same line Mr. Long said: "I do not believe it is necessary to shut a sow up two weeks before time to farrow. I think it is an injury to the sow. If you know when they are due to farrow, shut them up a day or two before time and it is much better for them and for the pigs."

Mr. Turner gave his thought by saying: "I agree with the gentleman with regard to old sows but with young sows we have not handled I think it is well to get them up sevearl days before and get acquainted with them so there will be no excitement or trouble at farrowing time."

Mr. Long expressed it as his opinion that a breeder should be acquainted with his sows long before farrowing time.

Mr. Baker gave his experience thus: "I have been breding hogs a good many years. I have gone out with a lantern and blanket and when I saved the pigs I said I helped but when between the old sow and I we lost them all I blamed that to the old sow. Lately I go to bed and say she knows more about it than I do—the youngest one on the place."

Mr. Roberts' experience was much in the same line. He said: "Hearing other people express their opinions shows me how far I am off. I have sat up with a blanket but I don't want anything to do with it now. I want the sow on a board floor and then let her alone. After she farrows she ought to have some water. Then open the door and let her alone. If she wants food let her get out and get it. Feed the sow and then let her tend to the pigs. Pigs have sore mouth from a foul stomach. Keep the little fellows working for milk and you will have no bad results. If I was raising a sow and pigs for my own use I would turn her into the clover field and let her alone."

Mr. Baker again expressed it as his opinion that the sow should be left alone to which Mr. Munson said: "I do not agree with the gentleman at all, because if you are breeding hogs and raising them for breeders you must have them come in March for best results and we all know that in March we have bad weather. I manage to raise large litters simply by staying by my sows. I don't put them in a barrel but I put them up to the mother and she does the rest but I want to be there to keep them from chilling, because some nights it gets pretty cold in the hog house."

The next paper read was that of L. H. Roberts, of Paton, Iowa, on "Feeding a Show Herd."

FEEDING THE SHOW HERD.

L. H. ROBERTS, PATON, IOWA.

There are so many factors entering into the preparation or the show hog that the subject of feeding alone cannot be taken up if intelligent consideration of the whole matter be given. To begin with, there is the hog himself. At this time there is such excellent material to select from, in all breeds, that the showman does not in this respect have to meet the serious problem that confronted him a dozen years ago. But even now, the competition of the show ring has become so fierce, and the requirements so exacting that the utmost care must be exercised in the choice of stock to be fitted. We will, to begin with, take the case of spring pigs that are to be prepared for the fall fairs. The whole crop of pigs should be carefully examined time and again, and their general growth and progress noted before any fitting is begun. This is a matter of weeks or months rather than days. Then from those that show a tendency to respond readily to feed, and that have a quiet disposition, select such individuals as, in your judgment, will more nearly fill the eye of the judge when they get into the ring. A knowledge of the habits of growth of the sires and dams, and of the still more remote ancestry, is valuable at this point. Take pigs that are good on feet and legs. The hind legs should be straight. The front legs should be straight, free from any tendency to bend in or be knock-kneed, and set wide apart. The feet should be short in the pastern, toes short and holding close together. Observation of these points will in a great degree avoid breaking down on the feet, a fault that has a very ugly look in the ring. I am not an advocate of a coarse boned hog. It is apt to be flabby of muscle, as well as slow in maturing. A well arched back, in which the arch is not broken by a drop behind the shoulders or slope toward the tail head, is essential. Pick a pig whose heart girth is in proportion to its length and that is not faulty in flank, observe those requirements of color, formation of head, style of ear, etc., that are called for by that breed to which it belong. Do not select any pig that has had thumps, scours, or any other disease, nor one with any skin disorders. All these have a depressing effect upon the natural constitutional vigor of the pig, and in his race for ribbons he must not be handicapped by any influence that will prevent him from getting the benefit of every ounce of food he consumes. See to it that he starts free from any burden of lice or worms, and keep him that way to the end.

The surroundings and conditions under which the hogs are kept are equally as important as the food that is provided for them. I prefer to keep but few together. The feeding habits of each can in this manner be best observed and catered to. Start with plenty of pasturage. White clover and blue grass are first choice. Oats or rye will do, and rape is valuable. As the growth and progress depend a great deal on personal comfort, it is important that there be a cool, dark retreat, where the hog is safe from the attacks of flies. A good plan is to place a small individual house under the shade of a tree, and to cover the doorway with a curtain of such material as will exclude light and flies, nailing it only at the top, so the hog may go in and out at pleasure. Keep this house clean and free from dust and use from time to time some mild disinfectant that you know will have no bad effect.

Before taking up the subject of feed, I want also to urge the importance of exercise. Lack of attention to this point may cause failure, even though all other requirements are carefully looked after. Get fully acquainted with your pigs, so they know you are their friend. Then in the early morning while it is cool, take them for a walk, going slowly so they may feed on the grass along the way. An hour or more is well spent at this. Never let your pigs get excited. Keep them away from anything that is likely to irritate them. Don't stir them up in the heat of the day to show Tom, Dick or Harry how they are coming on

To start with, a liberal supply of new milk, while not absolutely necessary, is the best foundation for a successful ration. It possesses all the elements that are necessary to an even development of bone, muscle and fat. The additional food should in so far as is possible be possessed of the same character. I have seen excellent prospects spoiled because the feeding produced growth at the expense of flesh and finish, and many more because the feed caused an accumulation of fat out of all proportion with the growth of bone and muscle. Instances of both are found in the underfitted and overfitted hogs to be seen at every fair. It is not possible to lay down any hard and fast rule as to what to feed or how to feed it. A general rule may be given, but its application must be governed by a close observation of its effects. Variations are necessary because no two animals make exactly the same response.

There is little choice of what to feed for best results. Wheat shorts has a special fitness, and, in connection with milk, affords a combination that can scarcely be equaled. It, in my opinion, is the main feed. In order, however, to provide a variety and keep the appetite always on edge, it is well to have at hand ground oats, ground or shelled soaked corn for occasional feeding. Ground barley is also held in high appreciation by some, and may be used in place of corn to good advantage during the earlier portion of the period of fitting. A quantity of oil meal is an essential to be used as a means of keeping the bowels properly regulated.

In feeding shorts, mix it into a thick slop. A watery, sloppy feed is objectionable, leads to overloading the stomach and unbalancing the digestive machinery. The feed should be prepared fresh for each meal, and only in such quantities as may be sufficient for the time. I believe best results are obtained by feeding three times a day, and each time at an exact hour. This regularity at stated times is quite important when feeding three times daily. Be careful never to overfeed, or to give enough so the hog leaves any in the trough. Give only what he will clean up as though he is afraid it will get away from him. I do not mean that he is to be forced to leave the trough hungry, but it is the fitter's duty to know when the pig has enough, and when it is at the point of getting too much. Keep the pig eating as much as it can assimilate, and no more. Of course the earlier feeding should not be so heavy as that of the later part. Too much forcing in a young pig is certain to cause breaking down in the feet, and too free corn ration at any time is apt to produce the same result.

It will be well, perhaps, to give a word of caution as to shorts. The perfection of milling machinery has lately succeeded in extracting the most valuable feeding elements from shorts, so that in some cases little remains but woody fiber having no strength. When we have advised the use of shorts it was the old fashioned sort.

I have made no mention of the use of stock foods and the more lately introduced packing house by-products, having had but little experience with them, and being inclined to place full confidence in the articles mentioned.

Having gone to all the trouble of securing a perfect physical condition, it is not to be overlooked that a proper system of grooming and furbishing are called for so that it may be presented to the best advantage, so that every strong point will stand out prominently, and every shortcoming be diminished to its smallest possible point.

This paper brought up the question of how long before show time you must feed your show stuff to which Mr. Roberts said: "If I was going to show I would not feed any more than I had to for the show. You have to take care of them from the word go to get the pig up in good shape. Take care of him from the time he is born and never let him get back. If a pig is to be shown in the six months class it takes six months to get him in shape,—and nine times out of ten you have ruined the pig. You work for the ribbon and that is all you care for if you have a show herd. If you come to the Iowa State Fair with twenty hogs under six months and have ten of them in breeding condition and the other ten fed away up, which one will the people buy? They will buy the fat pig instead of the one in breeding condition. If the public breeding people want that kind of pig we must get it fat. If a pig has been fed and won honors at the fair he is useless afterward and you had better sell him and let the other fellow get the experience."

Mr. Browning stated his view of the case as follows: "I think it is every breeder's duty to look further than that. If he sells a hog that he knows will not do well he should never sell him. He should raise them for a reputation of his own careful breeding and produce the right kind of stock. There is more in it than the dollars and cents. I would rather sell a pig that will do well and that will not look so well. Then if he is over fed and does not do well, the purchaser cannot kick, because I did all right. But on the other hand, if he gets a pig and he is over fed before he gets him and does not do well in his hands, I get the blame."

Along this same line Mr. Browning continued: "I do not think it is necessary to the case that because a hog is finished out that it is spoiling the breed. The best hog I ever owned was fat to the limit. He was about as broad as he was long but he was one of the best hogs I ever had. On the other hand, I got a hog once from Illinois that the man said he had been saving for a show hog and he was a hard looker, but he was properly raised for a breeder and was excellent in that respect, so we cannot always tell by the looks what there is in a hog. It depends on the blood there is in him. If he is a mixed hog he may look like a thoroughbred but he will not be all right for a breeder. Proper care and feed will improve him but after all it is the blood that makes him valuable. You can only determine his value by use. Then you can tell just what he is worth. By the record of his ancestry you may have some idea of what he will do but you do not actually know until he is tried. In every breed of animals there is a certain limit of perfection and when they get beyond that they go backwards and this is sometimes the case with good hogs. You can raise them just so far and get them to a state of perfection and then they go to pieces."

Someone asked the question as to whether you could use any hog if it was properly fed and cared for. In reply Mr. Browning said: "I would rather trust a rather bad looking individual, not a scrub, but still if he had a fairly good appearance I would go more on his pedigree than on his individual appearance because you can go into any stock yard and pick out good hogs far beyond the average show hog in appearance but no good as breeders. I would much rather trust a hog with good ancestry than to go on individual appearance."

Mr. Russell asked how long before show time an aged hog should shed and Mr. Roberts replied: "I would like to have them shed just long enough before the show to get the hair just the right length. I could not tell exactly how long. There is no trouble with yearlings but you have to watch it on aged hogs. You can not take an aged hog ordinarily and fit him for the show ring in a short time. You must watch him for a year. If his hide is hard you must soften it and keep it soft, and there is no way to do it but to have them kept quiet. The quieter you can keep them the better. Keep him away off and if you ever want to use him take him back as soon as you are through with him. When we were in the show ring we were after them all the time. When we went home from the fair we began watching for the next fair. You cannot put a show herd in a yard and feed them all out of the same trough. One sow will be ready soon and after she gets to the top just that minute sh gos down. Another will not be ready so soon, so you have to watch them and have them all at their best just as near the day of the show as possible. Some feed too fast and some not fast enough. With yearlings or fall stuff they need no corn until the last four weeks of feeding. New milk will keep the hog at his height in pretty good shape. We used to feed cracklings also. It don't pay to fit a show herd now because competition is too strong. There was a time when we made money and yet with all that I do not think I made a dollar fitting hogs so far as dollars and cents are concerned. We tried it for fifteen years and worked hard. We got our share of the ribbons and produced a good hog, as you know. Another thing to remember is to train your hogs and keep them quiet at the show. It makes lots of difference when the judge comes around."

Dr. Hammer introduced the question of action by the Association looking to the free return of crates in which hogs have been shipped. After the matter had been talked of considerably, however, it was learned that there was a ruling of the express companies that crates might be returned at a charge of twenty-five cents each, which stopped any further action.

In the absence of Mr. Ausman, the Secretary presented his paper on "How to make a Successful Public Sale," to the Association.

HOW TO MAKE A SUCCESSFUL PUBLIC SALE.

L. E. AUSMAN, MERRILL, IOWA.

Perhaps the fundamental principle on which the plans for a public sale are to be built, is the possession of good stock, not only that having a high grade of individual merit, but in addition such as answers the demands of the best breeders with reference to the blood lines involved. Like any other merchant (for the swine breeder is as much a merchant as he who sells dry goods or groceries) the breeder should make it a point to keep for sale that kind of hog and that strain of breeding that the public is buying most freely and paying the highest prices for. My experience in making public sales, which covers a period of a dozen years, convinces me that there is greater profit and more personal satisfaction to myself and my customers in a consignment of strictly first-class stock of up-to-date breeding than in half a dozen sales of ordinary or poor things. One good sale is an advertisement for the next. So I repeat that first of all good hogs are the basis on which to begin.

Having stock of the right sort, it follows that they should go into the sale ring in the very pink of condition. While they should not at sale time carry such a quantity of flesh as would make them desirable subjects for the pork market, they will sell best if fat. They should be fed in a gradual way which shall at sale time bring them to the culminating point of highest bloom. This preparation is one of great importance, involving careful judgment and unceasing oversight, as the bloom point lasts but a short time, and too much fitting is as harmful in appearance as too little. While it is not within the latitude of my subject, I cannot pass it over without the suggestion that it is almost necessary to live with a sale consignment during the period of preparation. They can never be too good.

Careful grooming must not be overlooked. When each animal is driven into the ring, let it be in his best possible form. If a coat is uneven or rough or shaggy, make a free use of shears and clippers. Trim off surplus horn in hoofs. Brush the coats with some harmless dressing which shall add glossiness, but not so much as to have a greasy effect. Let every hog go into the ring directly from the hands of a man who shall have no other duty than to see that it is clean, well brushed and as attractive in every way as possible.

Every hog should early in the day be marked plainly with his catalogue number, so that buyers may be able to identify, examine, and make their selections before the sale opens. My preference is for a large white figure printed on the back with white lead. This is easily seen from any point in the ring and avoids confusion as to number.

As the personal comfort and good nature of the bidders have much to do with their liberality in bidding, the lunch and tent are worthy of consideration. The lunch or dinner I have always made quite a feature of, and at most of my sales I have arranged to have some church society serve a chicken pie dinner free to all who came. The plan has been highly complimented, and was comparatively inexpensive.

The tent naturally follows in importance. It should be large enough to accommodate the prospective attendance. Have it in place, with seats all arranged the day before. If the day be cold, one or two stoves should be provided and the tent closed up and heated in the forenoon. Get your crowd from dinner into the comfortable tent with as little delay as possible, and start your sale while they are in good humor. When the auctioneer has started to selling, anticipate his action just enough to have another hog in the ring the instant he calls "sold". Promptness in selling is commendable. When a sale is going along nicely, and when a fair figure has been reached, it is not a good plan to hold and hang on for another bid. Have help enough to handle the hogs promptly. Avoid any exciting occurences, or anything that will draw the attention of the crowd from the hog in the ring. Do not let any controversies arise, and do not undertake to make any explanations unless at the request of your auctioneer. Arrange your programme of selling before starting, let it be well understood by the auctioneer and all your helpers, and then follow it out to the letter. When a hog is sold let the clerk announce the name of the buyer, so there may be no misunderstanding in this respect.

The auctioneer and the advertising are both points for serious consideration. In my own case, I have always held that, with reference to auctioneers, the best was none too good. I prefer that the principal auctioneer do all the selling, and that he have in the ring one helper who will work with him in harmony. Be sure that the auctioneers are men who have good knowledge of stock, a wide acquaintance among breeders, and standing as to judgment and business integrity.

There are two branches of advertising that should receive equally careful treatment. For local effect, liberal use of county papers circulating in the immediate vicinity is advisable, and should be supplemented by covering the territory well with bills. To attract the attention of breeders and those from a distance the agricultural and live stock publications must be resorted to. These are somewhat expensive, so that only those should be used that circulate most in the territory from which buyers may be expected. In my own sales I have confined my advertising to two or three of the best, choosing those that stand best among breeders. I find that there is a double means of drawing through this plan. First is the actual result from the paper itself. The other is the personal work and influence of the representative of the papers. This last is apt to bring buyers for the best things in the sale. This influence, however, can only be secured through a contract sufficiently large to justify the special attention received. I favor good large advertisements in a few good papers to the same amount of money expended on smaller spaces in more papers.

Catalogues should be carefully prepared, complete in every detail, and giving all the arguments you have to offer. In addition to those sent to applicants brought through the advertising, it is well enough to send them also to such acquaintances as you have reason to believe would be interested in the stock you have for sale. It is important that every call for catalogue be attended to and I have found it especially profitable to follow each with a personal letter and invitation to attend the sale in person, and suggesting that if that cannot be done a bid be sent. It is quite a help to have in the crowd the more prominent breeders around home, and better yet, one or two "big guns" from the outside. These men often help through buying, acting as leaders.

Personal popularity is to be cultivated, and for this reason it is well to place all settlements in the hands of a banker. It avoids any bad paper, and throws the responsibility on the banker.

At the close of this paper Mr. Benson said: "I would like to call special attention to having a programme for your sale before the morning that you begin. I think that is one thing that many breeders fall down on. We have occasion very often to go to sales where when we get to the farm we would have no reason to think he expected a sale, perhaps not have them numbered and when we ask him for a certain lot of hogs he says they are around by the barn or straw stack. Some get out their catalogues and get them in the office just a day or two before the sale, or do their advertising just two or three weeks before the sale. My idea is to have your advertising out early. I would rather get it out a month before than two weeks, and I would rather have five hundred catalogues in the hands of men who want to buy, than twenty thousand with people who would not read them. It is a great help to get out a good catalogue and send it out to men who inquire. You can not increase in personal popularity too much. The auctioneer likes to do all he can for you. Just show him how and he will be ready to help."

Mr. Keil also said a few words on this subject. "I agree with Mr. Benson in that early impressions are the most lasting. I run across the same things that he mentions and it has a great deal to do with the impression we get. When we get to a place and find the offering all mixed up, some six months old with the three-year-olds, large and small all running together, we wish we had not come until noon, so they could get them ready. They should be gotten ready the day before so you can mark them the first thing in the morning and be ready for the sale on time."

At the close of the programme and discussions following the papers, matters of general interest to the Association were taken up and we give below a brief report of those of general importance.

Mr. J. C. Simpson, was present and addressed the meeting as follows:

Mr. Chairman and Gentlemen of the Iowa Swine Breeders' Association: I hoped to have ready before this meeting a preliminary sketch of the proposed hog barn for the State Fair grounds, and am very sorry that I have not this sketch to present to you this evening. I have been very busy of late, and have not had the time to advise with the architects to any extent, consequently they have been unable to prepare this sketch. However, I have given the matter considerable thought and find that it will take a building considerably larger than I had first supposed, to house the great number of hogs annually shown at the State Fair. Nothing preventing, we expect to have a preliminary sketch of this building ready by State Fair week, and have the same on exhibition in the office of Mr. Johnston, the superintendent of swine, so that you may all look it over, and offer any criticisms or suggestions that may occur to you. In this way we expect to get new ideas for another sketch which we will have made to present to the board at their meeting in December. I believe the board recognizes the urgent necessity for this improvement in the swine department above every thing else.

In the sketch for this new barn, we will endeavor to so arrange the pens, that one location will be equally as desirable as another. I have no fear but what we can get an appropriation from the legislature to erect this barn, if we can agree upon suitable plans. The swine industry of Iowa is entitled to it and we believe their demands will be recognized. No other state fair or exposition compares with the Iowa State Fair in the numbers and quality of her hog show.

As stated before we have not completed any preliminary sketch but the architects have made a hurried estimat on the cost of a building of sufficient size to put in 1200 pens, and find that the expense would be in the neighborhood of $50,000. While this amount may seem large, still when you stop to figure the thousands of people who are interested in swine breeding, and what this show means to the Iowa swine breeder, it is a very small item. When the appropriation is asked by the board for the erection of this building ,they should have the earnest support of every swine breeders and raiser of the state. I thank you."

Mr. R. S. Johnston, Superintendent of the Swine Department at the Iowa State Fair, was also present and made the following remarks: "Mr. Simpson has about outlined by idea as to the building but I think we have made a little start by giving you a half more money that we have ever given before. It used to be about $1380, last year it was $1700 and this year about $2500. There are now five money premiums and two additional ribbons. As Mr. Simpson has said, we hope to have a sketch of the building ready by fair time for to pass your opinion on. I have not seen it myself but have an idea of the sketch and about what it will be, and I think it will be better to have a good building with the stock all under one roof than to have it scattered all over the fair ground. I think the Board will have no hestitation in asking for an appropriation to build this building if all the breeders will help us and there will be no trouble in getting it. Last year I was very much surprised at the condition of things out there. I supposed there was better means of keeping the grounds in sanitary conditon. I shall make an effort to secure better conditions at the first opportunity. You all know we are very much crowded for room. When the pens are all occupied and the men in their tents and with sheds and crates scattered about there is hardly room for a team to get through and gather up the ltter every morning, as it should be done, but I am going to do the best I can for you. I would like to say a word in regard to influence. Perhaps there is not a senator or representative in Iowa but has some acquaintance with a breeder and nearly every breeder has some acquaintance with a representative or senator and if you will use your influence with them it will help a great deal. Get the representative from your county convinced that you should have it and he will come here prepared to vote for it, and if we all do that they will every one come prepared to vote for it and there will not be a vote against it."

With reference to a plat of ground which this Association had at its special December meeting requested the Board to set aside for a model hog yard, the Secretary reported that the Board of Agriculture had granted such a tract but as the location was not convenient to the prospective new hog barns no action had been taken toward its acceptance with the understanding that when the new buildings were provided a location might be selected that would be convenient.

The matter of recommendation of judges for the Iowa State Fair was brought up but there seemed to be so much of an inclination to talk, and a superabundance of opinions made it impossible to make any recommendations and the matter was left open.

The committee on resolutions congratulated the officers on the success of the programme, the authors of the different papers on the manner in which they had performed their part, thanked the officials of the Iowa State Fair for the improved classification in the premium list and increase in amount of prize money, and complimented President Roosevelt and Secretary Wilson on their efforts to procure a square deal for the meat producers of the country.

A resoluton was also offered asking that the congressmen and representatives of Iowa be requested to use their influence in securing such legislative or other action as might lead to an open market for United States' hog products in the German Empire.

The chairman announced that the next regular meeting and election of officers would take place at the Iowa State Fair Grounds on Wednesday evening of fair week.

A GOOD BLENDING OF VARIETY, UNITY AND HARMONY.
(Reproduced by courtesy of "Successful Farming.")

PART V.

PROCEEDINGS OF THE
TWENTY-NINTH ANNUAL MEETING
OF THE
IOWA STATE DAIRY ASSOCIATION

HELD AT CEDAR RAPIDS, NOVEMBER 1, 2 AND 3, 1905.

OFFICERS.

S. B. Shilling, President,	Mason City
W. B. Barney, Vice-President,	Hampton
P. H. Kieffer, Secretary,	Manchester
F. M. Brown, Treasurer,	Cedar Rapids

The twenty-ninth annual meeting of the Iowa State Dairy Association was held at the Auditorium, Cedar Rapids, Iowa, November 1, 2 and 3, 1905.

The meeting was called to order Wednesday, November 1, at 7:30 P. M. President S. B. Shilling in the Chair.

The Chairman: The meeting will please come to order. Much as I dislike to do so, I shall have to request that the people occupying the booths will please sit in front of them during the sessions. It is not because I am afraid of having you in there, but the people coming in and seeing you in the booths might possibly go in there and perhaps create more or less confusion.

We will open our exercises this evening with invocation by Reverend J. W. McNary.

THE CHAIRMAN: The next on the program is a piano solo by Miss Agnes Kouba, of this city.

THE CHAIRMAN: We will next have the Address of Welcome by Honorable Charles D. Huston, Mayor of Cedar Rapids.

ADDRESS OF WELCOME.

HON. CHAS. D. HUSTON.

Mr. Chairman, Ladies and Gentlemen.—I esteem it a great pleasure as well as a great honor to be permitted to attend this meeting, and bid you welcome to the city. I take it for granted that all good people are glad to come to Cedar Rapids; just as glad to come as bad people are glad to get away. The fact that you have been met at the door by a policeman is not to be taken as prima facie evidence that some of your members are under suspicion, because there is not one among us who would think that any of the members of the Iowa State Dairy Association would carry anything away that does not belong rightfully to them. No, my friends, the policemen are here to assist you in having a good time, to find anything that you may lose and return it to its rightful owner. And more than that,—on Monday of this week we had a very wet day and some of my friends thought it was going to be a wet week, and some of your friends thought because of that many of you would not come at all; but I want to say to you that no one should stay away from Cedar Rapids because it is wet in the morning, or because it is wet in the afternoon, for I am here to assure you, each and every one, that you will always find it dry enough in this city after ten o'clock at night.

The city of Cedar Rapids is not the only city on the map of Iowa, but it is one of them, and one that is growing all the time and growing along correct lines. We have a citizenship that are ever and always interested in the development and the betterment of this city, just as you gentlemen are interested in the development and betterment of the industry of the state of Iowa in which every man and woman should be interested.

According to the last census report Cedar Rapids was first of all the good cities of Iowa in the matter of manufacturers, but even though that be the case, Cedar Rapids has yet some good factory sites left, and I could have no greater pleasure than in welcoming to our city as permanent residents a number, a goodly number of the members of the

Iowa State Dairy Association to occupy those sites. I am informed that the membership of your organization does not consist wholly of buttermakers, but that you include as well, salesmen, managers of creameries, commission men and manufacturers of and dealers in dairy machinery of all kinds, and they are all interested in a greater or less degree in the development of the dairy interests of Iowa, yet in their infancy.

Twenty-nine years have elapsed since the formation of your organization, and from that day to this there has been a steady and marked improvement in the art of buttermaking, and that is due, in a great measure, to the knowledge which you and others have obtained by attendance upon your dairy conventions, because of your dairy exhibits and your dairy schools. That is your chance for improvement in your line and in all other lines, and as to development the field is unlimited. And I am sure that with the great body of men, such as your association represents, composed as it is of some of the best and finest and most progressive men of the state, laboring all the time for the development of this industry, I am sure that the state of Iowa will in due time take her proper place as a leader not only in this industry as she has in others, and when that time comes I feel that you who have labored in season and out of season will feel that you have been amply rewarded for the great work you have done in the past thirty years, are doing now and will continue to do.

Now, my friends, the citizens of Cedar Rapids have always a warm welcome for those who come to our city for a good purpose. It is the hope of every citizen that you will be refreshed and benefited by your sojourn here. We invite you to visit all our public places, including our parks and libraries, our clubs, our manufacturing and jobbing institutions. We desire to treat you so well that you will want to come next year and the year thereafter, and if you should conclude to make Cedar Rapids your permanent place of meeting, it does not matter who will follow me in the position I now hold, I will guarantee that you will receive as warm a welcome at their hands as I extend to you now.

THE CHAIRMAN: In regard to the Honorable Mayor's remarks about the policeman standing at the door, I wish to state that the first man I had an introduction to when I came into the building was the policeman, and I told him then that I was just as well acquainted with him now as I ever wanted to be, and that I did not want him to cultivate the acquaintance of our boys, because they were not that kind.

We have with us Honorable H. J. Neitert, president of the National Buttermaker's Association, who will respond to the address of welcome.

RESPONSE TO ADDRESS OF WELCOME.

HON. H. J. NEITERT, WALKER, IOWA.

Mr. President, Ladies and Gentlemen.—I should think that it would become somewhat old to you people to have to listen to my response to the address of welcome at every annual meeting that is held at Cedar Rapids; I should think it would become oppressive and a burden to you as it has to me, and in fact I am at a loss to know what to say to interest you. I know of no good reason why I should be called upon by the Iowa State Dairy Association to respond to the twofold welcome of the honored mayor of this beautiful city of Cedar Rapids, but I appreciate this distinction through their invitation and appear before you to respond briefly as possible and confine myself to such matters as may be of interest to the citizens of Cedar Rapids.

It is true that we have always met with a hearty welcome when we held our conventions in this city; we have always been treated with the utmost liberality and cordiality. I do not know that any members of our organizations have violated those privileges and I believe, Mr. President, and feel confident that the character of the members of our association and their associates that come here is above reproach. You could hand them the keys of all the safes and doors of this city and they would not violate any confidence reposed in them, but we do not ask for the keys from the fact that if anything did happen to occur which was wrong they might accidently lay the blame upon some of our members, consequently we do not want the keys, Mr. Mayor.

I know of no city anywhere for its progress, its ambition, its cleanliness, its industries, its education—common schools, high schools. academies and colleges,—manufacturing establishments, of the great packing industries, the greatest oatmeal mill in the world (you have probably heard that before, but it will bear repetition a thousand times) the beauty and architecture of its streets and parks, that can compare to Cedar Rapids. It is known by its many churches, which show the great devotion of its people. The citizens of this city are of a high degree of intelligence (this is not flattery, I am not seeking office) which is evidenced by the progress and prosperity of the city; it is a city of many homes. I know of no place (and I have visited many cities in this state and others), I know of no place where so large a proportion of its inhabitants own and occupy their own homes as in the city of Cedar Rapids. The home is the bulwark and the safety of our government. As has been said, and truly said, that education is the perpetuity of our form of government, it is equally true to class the home as a co-partner with education.

Some of you may wonder what our organization is for, what its object is in holding these meetings. To start out, Iowa, it has been said, is an agricultural state, and we do not deny it, but the most important branch of agriculture in the state of Iowa today, taken by itself. is the dairy industry. I am creditably informed, as has been reported I think by our honorable dairy commissioner, that in the state of Iowa we have in value over thirty-one million dollars, consisting of cows of three years old and over; over forty-one million dollars in value of heifers and cows one year old and two years old, and about thirty-one million dollars in value in steers and those feeding for the block. I mention this to show you the importance and the great investment in the dairy industry in the state of Iowa. That is not all. This gives sustenance and employment to thousands and thousands of farmers in the state of Iowa and, taken in conjunction with that, the value of the land which is used in supporting this great dairy industry, we have an immense fortune, and the output every year is immense I am creditably informed that the output of the cow and the hen annually exceed the output of the gold and silver of all our mines in this country.

We meet here to discuss questions which are of interest and importance to the dairymen and manufacturers. You might think that those things would become stale and old but, as has been often said, there is no such thing as standing still, we either go forward or backward. The truth of the matter is that those who have been interested in the work realize the most that we are still groping in darkness, as it were, as to many things that have not yet been accomplished. There is a great field for saving and as the lands in the state of Iowa and other states are becoming more valuable, as you are all aware, there is no question but that such meetings as this will be in great demand. where ideas may be exchanged and conclusions formed and benefits derived therefrom, because there must be more intense farming the higher the price for land becomes.

We have in our state one of the finest agricultural colleges, and I dare say the best in its effort to improve dairying of any in the Union. I do not wish to belittle or rob others of any of their achievements or the great benefits that have been derived from them, but our state has finally contributed that which was necessary for a long time for the education of many men and of farmers' sons of our state in the different branches of the dairy, to build a dairy barn and appropriated money to buy additional land where in a practical and scientific manner those things we all need to know will be demonstrated.

There has been, which I am sorry to say, too much of a tendency in times gone by to be careless in some of the work in manufacturing, but this I hope will soon be overcome, but the blame for this should not all be laid at the door of the buttermaker or the dairyman because he has not been stimulated, but a great deal of this has been caused from the fact that that man gets a half cent or a cent above. I stated a year ago, at a meeting held in another city, my friends of the association, buttermakers and manufacturers, and I state it again because I believe it to be true, by lowering the standard of your butter and the larger proportion you make of seconds you are offering the greatest encouragement you can to the manufacturers of oleomargarine.

The fact is this question of the dairy is in the minds of our best people of all our lands, in the largest cities, in the smallest hamlets. It is the purity of the article they want. You have no doubt read accounts of the physicians report of the danger from impure milk, and this is not confined alone to the manufacture of butter but should apply to cheese and all dairy products. These are matters of importance. There are a great many methods that were used years ago that will not do today, and I venture the assertion that if a member of our association who is engaged in the business now will drop out for ten years and not have anything to do with it, and then come back, he would say, "I would not believe it possible the progress that has been made".

It is absolutely necessary to keep preaching the necessity of wholesome and cleanly work in all the departments of the dairy every day of the year, to hold these meetings and exchange views so as to carry on the business in a profitable manner to all interested. It must not be profitable alone to the manufacturer but must be profitable to the man producing the raw product, and unless we take an interest in those matters the business will soon go into decay.

We have heard the hearty welcome from the mayor of the city of Cedar Rapids and to receive a welcome from such a city as he has described is a matter of great honor and should command the thanks of everybody, and therefore, in behalf of the Iowa State Dairy Association, I return many thanks to the honored mayor and citizens of Cedar Rapids for the twofold welcome that has been extended to this association. I thank you for your attention.

THE CHAIRMAN: The next on this evening's program is a reading by Miss Inez Jackson, of Cedar Rapids.

THE CHAIRMAN: We will next have the report of the Secretary.

SECRETARY'S REPORT OF THE IOWA STATE DAIRY ASSOCIATION, 1905.

Mr. President, Ladies and Gentlemen: I have the honor to submit to you the following report in connection with last year's business:

Balance on hand at last report	$ 63.20
Received from contributions	805.00
Received from advertising	207.50
Received from membership	230.00
Received from Treasurer, F. A. Leighton	569.81
Received from the sale of butter and tubs	962.47
Total receipts	$2,837.98

Paid to Treasurer, as per vouchers on hand	$2,812.28
Over-paid on pro rata fund	1.63
Balance on hand	24.07
Total disbursements	$2,837.98

We the undersigned auditing Committee have examined and checked the above report with vouchers and bills in hands of Secretary and find the same correct.

J. T. STANHOPE,
S. B. REED.

On motion, duly made and seconded the report of the Secretary was adopted as read.

THE CHAIRMAN: We will now listen to the Treasurer's report.

REPORT OF TREASURER.

IOWA STATE DAIRY ASSOCIATION.

1905

RECEIPTS.

Cash from Mr. F. A. Leighton	$569.81
Cash from Mr. P. H. Kiefer	63.00
Membership fees	230.00
City of Mason City, subscription	325.00
Sale of butter, Mason City	962.47
Dairy Mutual Insurance Co.	10.00
Monarch Refrigerator Co.	10.00
De Laval Separator Co.	40.00
Northey Refrigerator Co.	10.00
Gallagher Bros.	5.00
Diamond Crystal Salt Co.	15.00
Creamery Package Mfg. Co.	60.00
J. G. Cherry Company	60.00
Spurbeck-Lambert Co.	30.00
J. B. Ford Company	20.00
Edson Bros.	10.00
P. M. Sharples	10.00
M. H. Fairchild & Bro.	15.00

Worcester Salt Co.	15.00	
Elov Ericson	5.00	
Pitt, Barnum Co.	5.00	
W. B. Barney & Co.	5.00	
Kimball Glass Co.	10.00	
Vermont Farm Machine Co.	30.00	
Jas. Rowland	10.00	
Heller & Merz Co.	35.00	
J. H. Marrot	1.00	
H. S. Woods	1.00	
P. H. Kiefer	160.00	
Colonial Salt Co.	15.00	
Iowa Dairy Separator Co.	25.00	
Mower-Harwood Co.	50.00	
Interest on bank deposit	12.49	
Total receipts		$2,824.77

DISBURSEMENTS.

Rent, C. A. Cole	$1.50
Mrs. J. Stewart	1.00
Expenses, night watch	6.00
C. D. Smith	29.91
Freight, 1 tub butter	.25
Expense, Prof. G. L. McKay	24.00
Mason City Globe Gazette	14.00
W. J. Frazier	37.35
Reporting meeting, Mason City	44.00
J. Stewart, labor on booth	22.50
Adams Express Co.	3.41
Sarah F. Stewart	10.00
W. P. Barney, Mason City & C. R. meeting	12.60
Wells-Fargo Express	7.00
American Express Co.	11.55
U. S. Express Co.	27.79
Jurgens & Anderson Co.	35.00
Gerohty & Co., badges	66.66
Manchester Press	2.00
Hotel expense, F. M. Brown	8.75
Expense, machinery hall, Mason City	15.85
S. B. Shilling, Mason City	28.75
Times Herald	2.25
Lumbard & Smith, hotel	11.75
W. E. Smith, working butter room	25.00
H. D. Young, printing	11.50
Fred L. Kimball Estate	132.00
P. H. Kiefer, prorate money	850.00
P. H. Kiefer, postage and printing	49.35
F. M. Brown, expense	13.65

A. W. Trow	5.60	
P. H. Kiefer	156.02	
P. H. Kiefer, balance prorate money	20.00	
W. E. Smith, printing	1.35	
Miss Mary G. McGoorty	44.00	
Exchange	1.95	
Total disbursements		$1,734.29

Total receipts	$2,824.77
Disbursements	1,734.29
Balance on hand	$1,090.48

We, the undersigned auditing committee, have examined and checked the above report, with vouchers and bills in the hands of the treasurer, and find the same correct.

S. B. Reed.
J. T. Stanhope.

On Motion, duly made and seconded, the report of the Treasurer was adopted as read.

The Chairman: The appointment of committees should come next but, owing to the length of our program this evening I am going to claim the indulgence of the audience and will appoint the committees tomorrow forenoon, and will now proceed with the president's address, but first will say that for the first time I have to stand before you and make an explanation and apology for the absence of Mr. Jules G. Lumbard, which I know will prove a disappointment to you as it has to everyone of the officers of this association. We received a letter from Mr. Lumbard stating that he was at the first meeting of this association twenty-nine years ago, and I believe he has missed just two meetings of the association since that time. I know his absence will be a disappointment to you; it is to us, as it seems that a big part of our program is lost when we have not Mr. Lumbard with us. He says in his letter that although he is not with us in person his heart is with us here and he wished to be remembered to the boys, and it was only the exactions of a strenuous political campaign which kept hi maway from here. His campaign managers positively forbade his leaving the city at this time.

PRESIDENT'S ADDRESS.

S. B. SHILLING, MASON CITY.

Ladies and Gentlemen.—I can assure you that it gives me great pleasure to stand before you again in an effort to give you my third annual address and I want to preface any remarks that I may make to you this evening by this statement that in one thing at least it will have merit and that will be in its briefness.

I want to do the same that I did when I stood before you one year ago, and that is I want to call your attention to our splendid financial condition as read by your treasurer. They rather cautioned me against this but I find I cannot resist calling your attention to it because there is something I want to say afterwards, and if I leave the reference to our financial condition out I cannot say it. I do feel that we are to be congratulated; I do not refer to this matter with any idea of indulging in self praise or to give any degree of praise to any of the officers of this association, but do it because I want to see praise given where it properly belongs, and that is to the buttermakers of the state of Iowa. I want to say that were it not for the loyalty of the buttermakers of this state today we would not be in the position we are, that is to hold up a purse of a thousand dollars to be competed for this year. While we might have held and probably would be holding a dairy convention, I believe were it not for the loyalty of the buttermakers of the state the interest in it would be sadly lacking. We have in the room adjoining 219 tubs of butter. Now there are not 219 boys in the state of Iowa that came with their butter with the expectation of getting the high scores, it is not that that actuated them in bringing their butter here, and if any proof of the loyalty of the buttermakers was wanting in the support of our association it is there. Those 219 tubs are to me, and I believe to the other officers of this association, simply an indication of the fact that the boys are back of us now as they have always been.

As I said before I simply have to go a little further. I am not going to tell a story, but if anyone here had told us at one time that we would ever see the time when we had a thousand dollars at interest we would have considered that that man simply did not know what he was talking about; yet, by the treasurer's report you have just listened to, you know that such is a fact; that we have that amount of money. Another thing the treasurer informs me that he does not believe he will need to touch that loan this year, that the loan will be carried over and we are hoping that such good luck will fall to us that something may be added to it the coming year. To me this is very gratifying and the reason I emphasize it is that I want to give the credit where it belongs. I want to thank those contributors who have donated to us year after year, but the great bulk of our success lies in the loyalty of the buttermakers of the state of Iowa. If there is credit due to the buttermakers of any state it is due to the buttermakers of Iowa from the fact they are doing all this themselves,—we have no assistance outside of them.

I believe I can truthfully say to you, and facts will bear me out, that there has been some progress made in the dairy industry of Iowa during the past year. There seems to be an awakening or a realization of the fact that our climate, in fact our general surroundings are adapted to the dairy industry and that the maintenance of the fertility of our soil demands that in the future we engage even more extensively in this branch of the industry than in the past. It is just beginning to be realized by the average dairyman of Iowa that the dairy cow has great possibilities. The further we go into it, the deeper we investigate, the more profit we can see in it. The great trouble with the average dairyman in Iowa has been that he has had an idea that in order to get a good herd of cows he has had to expend a considerable amount of money, but it is gradually dawning upon us that it does not cost us any more to shelter a cow and but little more to feed a cow that will give from three hundred to five hundred pounds of butterfat, than one giving but one hundred and sixty pounds, as the average cow does today, but we realize that a great deal of this is in the fact that we have not gone about this matter intelligently, that we have not studied the question as we should have done.

Another great reason for our lack of success or backwardness in the business is that we have not got down to the idea that we are going to make it a permanent business, it has simply been a side issue. We have accepted what we have got out of the dairy business as a matter of course and have not investigated. The great trouble with the average dairyman in Iowa today is he is not an investigator; he has put his trust in God and a straw stack instead of the silo and ensilage, but thanks to the dairy schools of the state, to the agricultural colleges, the farm institutes and last but not least (and I believe now I am about to mention one of the most productive things that has been undertaken,—the buttermakers' meetings in Iowa)—have done much to spread the doctrine of good dairying and today we can go anywhere in the state and see a result of education along this line.

There is much to be learned and much can be accomplished by studying the question of feeding and breeding, but in justice to my hearers and in justice to the speakers who are to follow me on this question, I am going to treat this lightly, but with my experience of two years in filling the silo and feeding ensilage I do not believe that to the dairyman one-half of the benefit has ever been told. I believe it is the solution of getting interest out of our high priced lands. I believe it is the only true solution that has been offered. I believe this question of feeding should be kept prominent before the people of Iowa; I believe this should be impressed upon them; I do not believe a single agricultural meeting should be held but that question of feeding ensilage should be brought up, and the fact should be impressed upon the dairymen that they are never going to have it down to a paying proposition until they go into the dairy business and adopt the silo as the way of feeding.

The dairy industry in the state of Iowa has never up to the present time been general. It has only been in certain localities that the industry has flourished, but I want to say that there never has been a time in the history of dairy when there has been a greater desire manifested to to go into that business as a general thing than at the present time. I believe there is not a section in the state but is more or less interested in this question, that is not trying to get into the dairy business more than ever before. A reason for this I think may be found largely in the advent of the centralizing plants. The coming of those institutions in the country has aroused a great deal of discussion as to their merits and demerits and as to their probable effect upon the dairy industry. While we may probably censure some of the methods they pursue in the handling of their product, we must remember they are a part of the whole dairy system of Iowa and we must be liberal enough to know that the greatest good is accomplished when the greatest number are benefited, and we must not fail to remember that the introduction of this system of creamery business has opened a trade to thousands of farmers in the state of Iowa that were not accessible and could not go to a creamery.

We have just passed through a year of probably the most peculiar conditions in the history of dairying that we have ever had. We have seen the time during the past year when the great receiving centers of the country have been practically bare of stocks. We have seen various merchants parceling out their shipments in three and five tub lots in order to supply their trade, and this has been the fact too when we went into the winter months one year ago with fifty-six million pounds of surplus butter on hand. This year we have gone into the winter months with seventy-six million pounds surplus butter on hand. One year age we had very nearly fifteen percent increase in the consumptive demand; this year we have a twenty-five percent, increase over the consumptive demand of a year ago. Everything seems to indicate a continued era of prosperity to the dairymen; with wise and judicious management on the part of the men who have this great stock of storage butter at the present time, there can be no question but it can all be taken care of with a profit and with no injury to the dairy business, but the great trouble lies here, and I wish I could impress it strong enough upon the minds of the men who hold this butter, that if they do not push the price of the product too high so as to stop this consumptvie demand or to open the doors to oleomargarine, there is no question but it can be all placed in consumptive channels at a profit.

There is no question but this large consumptive demand with consequent high prices is almost entirely the result of the suppression of the illegal sale of oleomargarine. Lest I may be accused of self praise again, I am only going to touch this phase of the question lightly. It does not seem necessary for me to enter into any kind of history of the dairyman in trying to secure the production which they have. I will make this statement to you, which I believe will be sufficient, and that is that those who have watched the trend of events, those who have watched the history for the last four years know that in 1902 the output of eleomargarine was 126 million pounds and in 1904 less than 50 million pounds; and if you will stop to consider, one of the most remarkable things about that was that the price during this year was from three to five cents higher than the year before and that with the greatest effort on the part of the manufactures to place their product on the market, they only made an increase of about four percent. I will only dwell upon conditions as they are at the present time.

Those of you who have watched the returns from the internal revenue department know there has been a wonderful increase in the output in the last two months. We have not as yet received figures showing the out put for the month of September, but for the month of August I will say that the increase in the colored product was over 300 per cent over a year ago, and an increase in uncolored of 50 per cent. If it were not for this large consumptive demand we are having this would be an alarming feature, but it does not necessarily follow because this large amount of oleomargarine has been made that it has gone into consumptive channels. The fact is we have been led to believe that it has not gone into consumptive channels. The fact that the Chicago district for September failed to keep up its ratio by 40 per cent indicates to us that the large output has not gone into consumptive channels, although there is no question but that in time it will.

I did not get an opportunity to talk to the people of Iowa in the national convention as I have years before in regard to this, and you will bear with me just a minute longer on the oleomargarine situation, because I feel it is something that we owe to you that you understand the matter thoroughly. I want to say that so far as any legislation is concerned we have no evidence at the present time that anything is going to be done. We have this assurance though, that whatever is going to be done in the future, and there is no question but what we will have to meet them again in some kind of a struggle, will be in the line of preventing the coloring of butter. I simply give that as being the most plausible thing to do and, in fact, is something now under contemplation by them. The last lawsuit has been decided in favor of the dairymen. I want to say that so far as our law is concerned it is affording all the protection to the dairymen that we could reasonably expect. There is no question about its validity and for that reason we must look for a struggle in some other direction. I want to say that, unfortunately for us, one of the chief officers of our agricultural department today (I do not want to say that he has allied himself with the oleomargarine forces, because I do not like to accuse a man wrongfully when I am not sure) but one of the chief officers of the agricultural department is aggressive in his efforts in trying to prevent the coloring of butter. You understand what it would mean to the dairy interests of this state if this were accomplished. Backed by this and other information that we have, we know there will be something of the kind undertaken this winter. I will now leave this subject.

Now, ladies and gentlemen, I come to a question which is rather delicate; it is a question which I wish I knew how to handle intelligently and to handle it right. Iowa stands today, as was referred to a short time ago by Mr. Nietert, as one of the greatest butter producing states in the United States. If we could take the value of every milch cow in the state of Iowa today, if we could take the value of every two and three year old heifer in the state of Iowa, if we could take the value of every creamery and its equipment and add that to it, then take the value of every hand separator in the state, and the products in the shape of butter, cheese, milk, cream and by products and add them all together, we would have an array of figures that in their magnitude would be startling, and would so far overshadow any other line of agricultural interests in the state today that it would sink into insignificance. Yet Iowa is the only state that, with all this great magnitude of industry, does not receive any kind of state aid at the hands of the state legislature. I wish my voice were loud enough to be heard in every part of the state of Iowa tonight (Applause); I wish it were shrill enough to penetrate to every member of the legislature before going to Des Moines this winter so it would cause them to investigate the magnitude of this industry, to compare the state of Iowa with Minnesota where there are eight inspectors and an annual appropriation from the legislature of $2,000; to compare with Wisconsin where there are the same number of inspectors and where they receive the same state aid. I wish they would compare the state of Iowa with the state of Missouri, the s ate of Michigan or any other state in the Union today. Every comparison would cause them to hang their heads with shame for the negligence of past legislators upon this question. I wish I could reach the home of every man in the state that milks a cow that would induce him to demand of his member of Congress that he vote to grant assistance to an association that has been as instrumental, that in fact was the foundation of the dairy industry in the state of Iowa thirty years ago and since that time has been the greatest factor in the spreading of the doctrine of good dairying. I have been in earnest over this question. I have been forced to take a rather dark view of the situation for the coming winter. I believe that such action should be taken in the shape of a resolution appealing to the members of the legislature and that every member should receive a copy of it. I believe we should go on record before this meeting adjourns for, as I said, I do not believe we are in a good position to acquire this.

Those of you who were with us when we were fighting to secure the appropriation at Ames know that there was a feeling of antagonism aroused there. You know the bitterest fight of all was two years ago for the appropriation for the Ames dairy school, and I feel, having been there, that this leaves us at a disadvantage in trying to secure anything for the reason that the same members compose the legislature that did two years ago. I believe this should inspire us and that we should get after them harder than ever before to secure an appropriation.

Now I don't want any misapprehension to go out regarding the remarks I have made regarding the dairy school. The fact is the Iowa State Dairy Association has invariably taken a back seat when it came to securing those things. We know we need the dairy school at Ames worse than we do support for our association; we know we need that farm down there because we have realized that we have only been skimming the surface. With this as a nucleus to grow from we can get to the bottom of the subject. I believe we did the right thing and were it to be done over, I would be in favor of doing it again, but I do feel that we have turned in and helped every other institution in the state secure what they wanted and I believe that today we are in a position so we can ask them to help us. I am not in favor of laying down any longer in this question and, as I said before, I hope this body will take some action looking to that end so that we may receive that which really belongs to us.

Now, in conclusion, I wish to thank you, ladies and gentlemen and especially the buttermakers of the organization, from the bottom of my heart for the support you have given me during my incombency in office for the last four years, and I want to urge you to do this,— I want to say to you that in your state meetings, in your creamery picnics, in your district organizations you are doing the grandest work for the dairy industry of the state that has ever been done, and I want to urge you to stick to it. The only request that I want to make as I leave you is that you give to my successor in office the same hearty support you have given me. I thank you.

THE CHAIRMAN: Professor E. H. Webster, of the Dairy Division of the Department of Agriculture, will now address you.

ADDRESS.

PROF. E. H. WEBSTER, CHIEF OF DAIRY DIVISION, WASHINGTON, D. C.

Mr. Chairman, Members of the Iowa State Dairy Association: I am going to try to be brief in regard to some phases of the general proposition of dairy work outside of the state of Iowa. If you have let the remarks that Mr. Shilling has just made in regard to your own individual condition in Iowa sink into you sufficiently enough they ought not to be repeated, but if you have not I hope Mr. Shilling will repeat them several times before he goes away from this convention. Certainly Iowa should help its own dairy association. The questions that I want to discuss are of a little larger interests than your own immediate interests in dairying.

The questions of dairying the country over is one of the biggest questions we have before the American people. The products of the dairy,—the milk, the butter and the cream that is sold from the cows in our herds in the United States, amount to more than any other product sold from the farms of our whole country. It amounts, in round numbers, at the present time to nearly seven hundred millions of dollars. I believe that Iowa has the privilege of supplying somewhere between ten and fifteen percent of the total amount.

The great dairy industry of the country is confined to but few states in the country, but those states have done some remarkably good work and yet, when we take the average that has been done by the dairy cow on our farms in this country, it is surprisingly small and surprisingly little.

It seems to me we do not know all there is about dairying yet, even though it brings in more income than any other one thing on the farm. In fact there is no other industry that is so dead sure to the farmers as dairying. If he has a herd of cows on his farm, whether good or bad, he has an income and sure living. That is not true in any other line of agriculture. If he has a crop of wheat and it fails, he has nothing; if he has a crop of corn and it fails, he has nothing, but the cow goes right on and brings him some kind of income which will clothe his children and feed his family, be the times hard or good.

There is no business, no branch of agriculture today that has received as much attention from various sources to help in raising the industry, as has dairying. Our state agricultural colleges and experiment stations have spent more time investigating problems of dairying than any other phase of farm industry. They have done some remarkably good work and yet I want to show you that they have not done all they should.

The dairy division of our department has been remarkably active in developing the work of these stations and distributing the information gathered by their representatives all over the country as they passed from farm to farm, town to town and factory to factory and put this matter in readable form so that everyone may read and understand if he will, and yet the dairy division is not reaching anywhere near all the milking cows in the country. They are doing what they can, but the division needs help, it needs more sympathy from the men directly connected with the business; it needs the encouragement, the appreciation of this kind.

Perhaps next to the dairy division are the dairy schools, and yet few states have successful dairy schools today. I believe your state, and I can call it mine because I was partially educated in this state, has one. I believe you are in a fair way in getting at that school aid in bettering the production of the milk that goes to the butter factories in your state, something that has been neglected in this state and something needed perhaps more than anything today in Iowa is good hard work along the line of production. The various dairy schools are helping along this line; they are sending out young men who come into the schools and with a comparatively short course are ready to go out and take responsible positions on dairy farms, in creameries and cheese factories and other institutions connected with dairying.

This little gathering here tonight is one of the great events in spreading the dairy gospel. My only regret is that not more people attend these conventions. I recently came from a meeting of this kind in one of the Southern states where dairying should be one of the great industries and where a small number was present. I am glad that Iowa and some of the other states have created a different condition and more of the people are interested in attending these conventions.

One of the educational features that has helped in dairy work is the municipal state and dairy laws. We always have men who have to be guided, and our municipal authorities have been active in forcing the production of a pure article of milk for consumption in the cities. This line of education is one that is compulsory to a good many people. It should be more so; it should reach into the country where the farmer is producing a poor article of milk and bring him into line, and make him see the necessity (if he will not from any other cause) the necessity of producing a good article of milk to sell to his creamery or cheese factory, or ship to his buyer.

All those varied lines of influence have improved the dairy industry faster than any other branch of agriculture, and yet we ought to do more than we are doing, we know a great deal less about dairying than we ought to; there is much more to be learned than we already know. You take the question of breeding dairy animals. I venture to say that fully 50 per cent of the pure bred herds, so called, in this country, are probably scrubs and should not be allowed in the dairy herd at all. Yet those 50 per cent of poor producers go right on producing a large and larger increasing supply of dairy animals that are not doing what they should at the milk pail. Perhaps some of the breeders will take exception to this statement, but it is true nevertheless. You can take the reports of any dairy herd and you will find a large percent of that herd that are not good producing dairy animals. We have given too much attention to fancy points in breeding, to the length of the tail, the color of the hair, the curl of the horn and have learned to think they are indications of good cows, forgetting that the best cow is the one that gives so much milk or butter fat in the milk pail. It is only recently that I saw a judge score a herd of cows. He selected the first, second and third for award, and after he got through he said that the one cow he gave third to was a better producer than the one given first. To the practical dairyman, such as we have in Iowa, the best cow to have is the one that will put her product in the milk pail. She may not have as nice a horn as the cow that would get first prize at the show rings, but is the cow that will bring the money in and I believe when our breeders learn to know the needs of the dairymen that are selling milk, they will come nearer to breeding a class of stock that will be of profit to the dairymen of our country. It is too bad those things are so but it shows we need more knowledge in the scientific problems of dairying.

Another drawback in the work of breeding pure bred cattle is the fact that too many of our records have been made for short periods. We find too many breeders making a one week's record, or perhaps a fourteen days record. It does not tell what that cow is worth as a producer for the whole period of her lactation and it is a wrong idea, and an idea that is, I believe, keeping back the development of our pure bred dairy stock very much, and some of the breeders' associations at present are beginning to awaken to this fact and allowing only yearly records to go into their registry and when all our dairy breeders come to this we will have taken a long step in breeding dairy cattle.

The question of feeding,—we know little about feeding today. We don't know how much roughage or grain, what proportion we ought to give to a dairy cow. We know approximately, perhaps, but yet we know that there is much to be learned on this question. In this state and in most of the western states the roughage that is grown on our farms is the cheapest product of the farm and yet we buy high priced grains to feed to our dairy cattle, but whether we are feeding too much of that grain, whether we cannot grow more roughage at home and reduce the cost of a pound of butter we do not know,—we do not know sufficiently in regard to the amount of protein it takes to produce a pound of milk. Some experiment stations have done good work along this line yet we find a good deal of diversity of opinion, showing we have still some knowledge to gain along the line of feeding.

One of the questions that is going to be of importance in the future, I believe, is the question of flavor in butter as it may be produced by the feed that the cow eats, in other words—can we feed for flavor. I believe there is much in this if we would once get down to some scientific basis and know. We are not certain that certain feeds do not give flavors to our product; we notice there is a great deal of difference between butter in one section of the country and another, but we don't know whether the difference comes from different feeds or not. We have men claiming it does and men claiming it does not. We do not know, also, whether or not feed will change the constituents of the fats in butter. If you will travel in sections where they feed large quantities of cotton seed meal and huls to their cows and see the butter before it was colored, I think few of you but would pronounce that butter oleomargarine. It has every characteristic in many ways of oleomargarine, and yet it is pure butter. In other sections you will find different characteristics in butter. This is due to the different concentrates that go to make up the fats in butter. And whether we can control the body of the butter by the feed, we know too little about it altogether; it is a question which should be taken up and given thorough investigation and thorough study.

Another question which is going to be of importance is the question of natural color in butter. We find in the summer time our herds producing rich, yellow butter; we find our dried feeds in the winter give white butter. Somebody out to take up a line of experimental work to find what feeds in winter would produce a rich summer color. That question has not been investigated to any great extent and in order that it may be productive of good results, and it may be something we will have to look to in the future if we are going to protect the butter industry. Perhaps we can best do it that way if someone can feed the cow and make the cow put the color into the butter.

In the care and management of our herds there is much we ought to know in regard to stabling the cows, the advantage of air and light, etc.

Taking up the question of the production of milk, when we come to the manufacture of butter (which you people are more deeply interested in than any other thing) we run up against a solid wall in many points. The practical buttermaker in your creamery confronts many things to which we can find no answer. When we study flavors in butter we don't know how those flavors are produced today; we know that certain bacteria give a good or bad flavor but we have not been able to produce these flavors in any absolutely scientific direct way. We can control them to a large extent if we have the knowledge, but we cannot take a load of butter or milk and control the flavor of that as we ought. We get a tub of butter, like those in the next building, that shows a fine aroma and flavor and some equally good with different flavors,—there is a difference between those flavors, there is a difference between the tubs of butter; both would score the same, both be the same for use on the table, yet there is a difference and no one can tell why. It is a question that needs a thorough study and is a question that means a great deal if we are going to make a good flavored butter for our market.

There are a number of questions in regard to the manufacture of butter that are equally important,—to control the moisture of the butter, control the salt so as to get uniformity, control the amount of casein, etc., all of which are important, all of which we know too little about. Particularly the question of moisture today is getting more and more a serious problem with butter storers and those who buy and ship butter. I am told the internal revenue department has received hundreds of telegrams from butter storers asking for some help to keep down the abnormal amount of moisture in butter. There is usually too much moisture in, or else we go to the other extreme, and very few if any of us can tell how to do it properly today. We perhaps can tell them how to get the moisture in there but cannot tell when to stop. To do an honest business one wants to know these things. The question of determining the moisture in butter,—how can he determine quickly the moisture? Anybody can give him the recipe for that. It is no long process to get moisture in our butter as is it made in the creameries.

We do not know enough about storage temperatures in butter. A few years ago it was 32 degrees, now it is 5 degrees below zero and possibly we will go lower than that, and yet we do not know what is the best temperature; whether different qualities of butter require different temperature. Perhaps you think we do not know much about butter, but there are lots of things we don't know. We do not know anything about preservative qualities used in butter and what the effect is on the keeping quality and moisture content.

So we could take up the cheese industry and go through with it the same way as we have with butter. We do not know the chemical action of rennet on the curd in cheese. No one has demonstrated what other constituents besides rennet go to make the cheese desirable. The cheese industry is one of the smallest of our dairy industries. We eat less cheese in the United States than any other country, perhaps because of the lack of knowledge of the value of cheese as food and perhaps it is because we get so much bitter cheese that we do not like it. If this is true we will have to make a cheese our people will like and we can thus increase the growth of our dairy work.

On the matter of the supply of milk for our cities the municipal authorities have taken more note themselves in regard to government of this matter, and yet they are asking "Shall we pastuerize milk or shall we not? Is it a good thing to pastuerize?" and no one can answer whether it is or not. Of course centralizer men will say it is good when pasteurized to sell, but whether or not they are putting in the hands of dairymen the best implement, we do not know. We do not know whether it is good for infants or invalids; we do not know sufficiently about the bacteria content of that milk after pasteurization, and a whole lot of those things are still unsolved problems and yet they are coming before dairymen every day. It is only recently that a dairyman in the South wrote to the department and wanted to know what to do to deliver his milk to town sweet before ten o'clock in the morning. He did not know that the sanitary conditions at the farm had more to do with it than anything else. With all the knowledge we have on this question that man had not got hold of it and yet was intelligent, perhaps above the average intelligence. It shows how little we appreciate what has been done not alone what we ought to still do.

The question of disease carrying properties of milk is something that we do not know enough about, whether typhoid fever, scarlet fever, diptheria and other contagious diseases are carried by milk or not. Doctors disagree on that,—many claim it is carried and others claim it is not.

The question of infection of milk from tuberculous animals is one of vast importance. The infection of milk that goes back on the farm from our creameries, whether or not it will infect other animals on the farm. It is becoming more and more important to know whether milk produced by tubercular animals will transmit this disease to humans. No one has actually demonstrated this matter and you can see the importance of it.

Taking up the educational features we get along with the experimental, as I have already stated there are very many educational features that are of potent influence in the field and yet are not doing what they should, altogether. Meetings of this kind are one of the great educational bodies that help to scatter the dairy information given here all over Iowa and other states by taking up the question of bringing education direct to the people who need it. Iowa has two inspectors and should have ten times that many. Other states are being provided with good inspectors in the field for instructing the men at the creameries, the farmers in producing a better quality of milk, and so on,—helping to bring about a better condition, a more profitable condition of things. We need more inspectors, we need better inspectors in many of our states than we have. You are fortunate in having a good force as far as it goes, but it does not go far enough and you want to double it, and double it, and double it again.

One of the best things for the dairy industry would be the organization of test associations. The dairymen of Denmark have probably doubled the value from their herds by those test associations. They simply form a number of patrons into an organization and hire a man to test their cows and give them instructions in feeding, etc. It costs little to do this and I am glad to say there is a beginning in this in the state of Michigan, where a body of farmers, patrons of one creamery, have got together in a test association; have hired a man, who has had three years experience in Denmark test associations to go to their farms, visit them every month, make a test of their herds and weigh the milk to see whether they are keeping profitable animals or not. I said in the beginning of my remarks that in the pure bred herds at least 50 per cent were poor producers, other herds have about 75 per cent poor producers, because in ordinary conditions we find that 75 per cent of the animals are eating up the profits that the others produce. In many instances the farmer had better destroy three fourths of his herd and would make more money by doing so than he does today. The test association would show which cow was doing this and help him eliminate the poor ones. This is a subject which ought to take an hour's speech, but I have spent enough on that at present.

There must be closer co-operation between producers and manufacturers. The centralizing system is getting them further and further apart and I believe something must be done to check this tendency if we are going to have the best methods of dairying in our country.

One of the factors that is neglected, I believe, in dairy communities is the use of the local papers. Here and there we find a bright dairyman who will get the dairy items from his neighborhood into the local papers and keep before his people the progress in dairying in other communities, yet we find that most of the editors of this class of papers pay too little attention to matters of that kind, and I believe that every dairyman connected with a creamery or some reliable man in the neighborhood should see that the country papers that go into their homes carry with it the dairy gospel. It would be a potent factor in advancing the interests of dairying.

Another question, another phase of the work that I want to bring to your attention is to show the relation of the federal government to this line of work. You know the relation of your own state from your state experiment station, but perhaps you do not know what the federal government can do if it has the support of the dairy people throughout the country. There are many ways we help to carry on this work as a department of agriculture. We co-operate in a great many states with the experiment stations. When the state has not sufficient funds to carry on the work, or there are very special reasons, perhaps, the department will send men into that state to help investigate these problems I have been talking about. We have in this state two men working at your experiment station, we have three men in Connecticut, three men in New York and have men in the South, and may place men in other states to help them solve these problems of such great importance to the dairy people. The department of agriculture can furnish us more money for this work if the dairy people take enough interest in the matter to see that the department has these funds. The department is already carrying on independent researches in dairying. There are questions which are greater than a state can handle and we have men in the field who are taking hold of them, taking hold of some of these problems and helping to solve them independently of the experiment stations, but prefer to get the knowledge first hand through their own men.

The department furnishes literature which every farmer can have for the asking. The dairy division has published about seventy bulletins on dairy questions all of which can be had by any dairyman or anyone interested in dairying throughout the country. These bulletins have done much good and we hope to have them do still more good. The lines of investigation we are carrying on will cause the publication of a larger number than ever before and we want to place these in the hands of the people who can get good from them, and anyone can have them for the asking.

We try to help by attending dairy meetings and giving our aid wherever it may be needed and in this way broadening our own knowledge in regard to conditions of the country and bringing various dairy organizations in touch with similar organizations in other states, helping to amalgate the dairy interests from one side of the country to the other and show there is a feeling of close kinship between the dairy interests of every state, and it is part of our duty to help bring that about.

Now the dairy division can only do these things, as can other divisions and bureaus of the department, by first securing good men who can carry on these lines of investigation, who can preach the gospel of dairying and other agricultural pursuits, and we can only get these men by having sufficient funds to employ them. Here and there we pick up men who seem to be head and shoulders above their fellows, we try to get hold of them and place them where they can reach a larger audience than in their own localities, placing them in the experiment stations and in the field for lecturing, and in various works of that kind.

The dairy division can be helped by having sympathy of organizations of this kind, and by expressions of this sympathy through organizations, through individual effort, through communications to the department to show they are interested in the work. Our people at Washington are largely guided in the work by what the people of the country demand and when a demand comes for work there is always some way to meet that demand, and unless we know what you want we cannot do as much as we wish for you,—just as it is here in your own state at home. I feel sure that we have the hearty sympathy of the dairymen of Iowa, in fact I feel we have the sympathy of the dairymen throughout the country, and if you can help in this work by your sympathy, by your encouragement, you do not know how much good you may be doing right in your own state and in other states to increase the profits of dairying.

I am glad I can bring some of these matters to your attention and I hope that by so doing you will see what a part you play in the department of agriculture, as you have in your experiment stations, as you have in this organization,—it is all yours and you should reap results from it.

I want to thank you for the attention you have given me. I only wish I could express in stronger terms the way I feel in regard to this matter, but you know my limitations in that line and I want to bespeak for this organization the future it should have. I believe you will go on and become a power that will not only secure the necessary funds for yourself but for your experiment station, and will help spread the gospel of dairying further and further every year as you may meet together in your annual meetings.

THE PRESIDENT: I would like to make an announcement at this time, and that is, according to the by-laws of our organization, the election of officers should be held the middle day of our session, so therefore tomorrow at 11 o'clock we will meet to elect your officers for the ensuing year and I hope we will have a good aattendance at that time.

THE CHAIRMAN: We will now stand adjourned until 11 o'clock tomorrow morning.

THURSDAY MORNING SESSION.

NOVEMBER 2, 1905.

Meeting called to order at 11 o'clock by President S. B. Shilling.

THE CHAIRMAN: At last evening's session I omitted to name the committees and stated that I would do so at this meeting. I will therefore name them now.

AUDITING COMMITTEE.

S. B. Reed,
J. A. Stanhope,
J. Brunner.

COMMITTEE ON RESOLUTIONS.

H. J. Nietert,
C. Heileman,
W. B. Johnson.

It will be necessary for that committee to get to work at once.

LEGISLATIVE COMMITTEE.

E. M. Wentworth,
Wilbur Marsh.
W. B. Barney,
G. L. McKay,
H. J. Nietert,

I wish to make a statement in regard to this legislative committee and that is that I have not recognized the buttermakers on that for this reason, that we have to have men on that committee who can go to Des Moines when necessary. I understand the difficulty the buttermakers have in getting away, and if there was a buttermaker on that committee it might be so that it would be impossible for him to leave his work at the time when he was needed. That is the reason I have not put the buttermakers on the legislative committee.

VICE-PRESIDENT W. B. Barnay took the chair.

THE CHAIRMAN: Our constitution provides for the election of officers at this time and we will therefore proceed at once to do that. The first officer to be elected is the president of your association for the coming year. Nominations are now in order; who will you have for your president?

Mr. Anderson, of Oelwein: Gentlemen of this convention, it gives me pleasure to rise and nominate a man in whom we all have confidence. In our outgoings and comings, in our wanderings up and down, we find some men fitted for different vocations in life; some are fitted for the plow some for the churn, some for the church, some for the stage and some for the executive office; and while I say this, I do not mistrust that all those before me today are well fitted for the executive chair of this organization, but I feel that this organization in the thirty years that it has traveled through Iowa has made a continual progress, and I feel that the man I am about to nominate is practically well fitted to execute the duties incumbent upon that office, and I trust that here will be no dissenting vote, and that my nomination will receive hearty endorsement. It is with much pleasure that I nominate Mr. S. B. Shilling, of Mason City.

Nomination duly seconded by many.

The Chairman: All in favor of Mr. Shilling's election as president of your organization for the ensuing year, by accalamation, signify it by saying aye, contrary no. The ayes have it, and Mr. Shilling is duly elected President of this association.

Mr. Shilling: Now, Gentlemen, I don't know how I can stand before you and accept this office again. I told you a year ago when I accepted the office at Mason City that I did it with this understanding that if I took it last year you would not ask me to accept it again. I don't want you to think it is not a pleasure to serve you, but it does not seem to me, after what I said to you in my address last evening, that I can accept this office again. I will stand here now and make a solemn agreement with you if you will elect another man president that I will work just as faithfully in the future as I have in the past.

W. S. Moore, Chicago: We cannot accept anybody else; we have just elected a man.

Mr. Wentworth: Mr. Chairman, I move that we proceed with the regular order of business and elect the other officers.

Mr. Shilling: I never in my life have been in a position like the present one, I don't know what to say to the audience at this time,—I want to serve you, my heart is with you, I want to see the association prosper, and the only regret I have is that in the past I have not been able to do more for you. But I will say that since your election is so hearty I thank you from the bottom of my heart for this expression and I will accept for another year, although I have said time and time again that nothing would induce me to take it for another term but,—Oh, well, I will accept.

* * * *

Mr. Shilling takes the chair.

The Chairman: The next in order is election of your vice-president. Who will you have for your vice-president?

Mr. Dailey: I take pleasure in nominating the present incumbent, Mr. W. B. Barney.

Nomination seconded by Mr. Neitert, and unanimously carried. Mr. Barney was declared elected vice-president by acclamation, on motion the rules having been suspended and the vote of the convention cast for Mr. Barney.

* * * *

Mr. Barney: Mr. President and Gentlemen of the Iowa State Dairy Convention,—I will accept another term because you have elected Mr. Shilling as your president once more. I did so last year from the fact that he had been doing the work and as he has accepted for another year and has promised to do all the work, I will have to do as he has done and therefore I accept and thank you.

There are one or two things that I want to speak of in relation to this meeting and to our organization. I realize that this association has done a great work for the dairy interests. I am sorry that I am not able to notice more faces in this audience this morning of men who are milking and owning the dairy cow. I recognize the fact that I was elected to this office three years ago for the purpose of bringing those men out. Now I wish to say that if I could get as much interest among the dairymen of this state as the buttermakers seem to have in this association, we would have one of the strongest organizations in this whole country.

I have just one request to make of the buttermakers present here today. When you go home this year I would like to have you all take it upon yourselves to pick out one or two men who are your best patrons and own some of your best cows, and say "Here, Charlie, John or George, come down to the Iowa State Dairymen's Association with me next year." I have made some effort along those lines but I have not been able to get out a number I would like to see present, and I believe that if we could enlist the buttermakers we would be doing great good. Certainly I do not see that the dairymen or buttermakers could gain anything by being separated. Certainly the dairymen would not come out if they were separated from the buttermaking part of the convention. If the buttermakers will take just this little interest, I believe that we can get out a large number of dairymen hereafter.

I thank you again, gentlemen, for the office.

THE CHAIRMAN: The next election is to fill the office of Secretary. Who will you have for your secretary for the coming year?

MR. NIETERT: I take pleasure in presenting the name of Mr. P. H. Kieffer for the succeeding year.

Nomination duly seconded.

MR. DAILEY: I move that the rules of the association be suspended and that the chairman cast the vote of the association for Mr. Kieffer as secretary.

Motion duly seconded and carried, and the vote of the association being cast, Mr. Kieffer was declared elected secretary of the association.

THE CHAIRMAN: The next is the office of treasurer. Who will you have for treasurer?

MR. DAILEY: I move the nomination of Mr. Frank .M. Brown as treasurer to succeed himself.

Nomination duly seconded.

S. BAER: I move that the rules be suspended and the secretary be instructed to cast the vote of the association for Frank M. Brown for treasurer the coming year.

Motion duly seconded and carried, and Mr. Brown was declared elected treasurer.

On being called upon for a speech, Mr. Brown responded as follows:

It is with pleasure that I accept the office. I thank you for the honor, and if it is not out of the way I do not think it would be unreasonable to ask for an assistant for another year.

* * * *

(Cries of Kieffer, Kieffer, by the members.)

MR. KIEFFER: *Mr. President, Buttermakers and Members of the Association*: I am not in position to make a speech and I do not think that you are expecting to hear a speech from me, but I want to thank you for the hearty support that you have given me. I want to thank the dairy commissioner's office, I want to thank the State Agricultural College, I want to thank the supply men, the transportation men and all the men on the road, and I want to thank the buttermakers for their support. I will try to do the best I can for you the coming year.

THE CHAIRMAN: We have one paper on this morning's program, and that is a paper by Mr. F. C. Oltrogge, on Sanitary and Practical Improvements in Present Creamery Machinery.

SANITARY AND PRACTICAL IMPROVEMENTS IN PRESENT CREAMERY MACHINERY.

F. C. OLTROGGE, TRIPOLI, IA.

In this age of great progress, the strife that is manifested everywhere, is sanitation and simplicity. More has been written for the benefit of sanitary conditions during the past number of years, than on any other subject I know of. Millions of dollars are spent every year by this great Republic for sanitation, and millions more will be spent before perfection is reached, and the same is true in particular of the creamery industry of this and other states, as we travel through the country and see creamery buildings dotted everywhere, we find some apparently neat and clean, at least as far as the operator can consistently keep it, and keep himself looking anywhere near tidy, and that sort of creamery and operator I shall only base my remarks in mention of them. My intentions are, only to show or to point out that part of unsanitary condition existing in such creameries, that are kept reasonably tidy, and to those operators whose motto is "cleanliness" as well personally as it is in their every day work in the creamery.

Let us see if it is possible in our present creameries and with present machineries therein, to keep them in first-class sanitary conditions, without the operator or buttermaker becoming the slave to the impossible satisfying criticiser. He whose duty it is to handle and manufacture a product intended for human food one minute, and the next minute get on his knees, and scrub or wipe machinery which during the operation has bespatted itself, with grease or milk in places almost, inaccessible, and left exposed by the unthinking designer of such machinery. Yet the operator must keep himself looking neat, for he is expected to wait on some lady customer at almost any time who may want a few pounds of butter or a pint of cream who are not aware what kind of work he had done just before her coming in. Or some traveling solicitor may step in and find the buttermaker's clothes are not tidy, because he was just cleaning or adjusting some machinery, and to one not familiar with such work cannot understand why that buttermaker is so dirty.

They don't know that when a working gear on some churn springs a leak, that it means the removal of perhaps *several gear* wheels in order to repack or tighten some stuffing box, and the gear wheels to be removed have been so besmeared with grease, caused by the leak besides the necessary oil put on such gears, is not a 'kid glove job' or he may have been at work cleaning the lower sides of a square bottom vat 5 feet wide and 10 or more feet long and all the way from 4 to 12 inches from the floor. Do any of you imagine that it is *easy?* Yet did it ever occur to you that you were present when such vats were undergoing repairs or taken out to be discarded that you found the underneath of that vat filthy, and probably the thought struck you that that buttermaker was not neat, or no wonder that that creamery smelled bad, and such fellows I would like to ask, did you ever try to keep them clean and if so how do you like your job? Or have you special arrangements in your creamery whereby you can raise these vats so you can wash them underneath?

Did you ever see the ceiling and walls of creameries bespattered with grease especially in the neighborhood of separator jacks and drive belts of same? If so did you ever investigate the real cause of it? We know it should not be so, and should be washed off as soon as visible, but is this an every day job? Would you like to wash the ceilings and walls of your creamery every day? Let us investigate the real cause of it. I have in our creamery three separators, the jacks or intermidiates, are placed near the wall of the creamery. These jacks are made with an oil chamber between two bushings or boxes, and the oil from these chambers feed these bushings and as the oil naturally goes through, especially when bushings are worn somewhat, it goes through quite fast, and when it gets through it is caught on one side by the rope pully and is distributed in the creamery. On the other side it is caught in a hollow pully with a hole in the belt's surface of the pully through which it is distributed on the drive belt and from there to the ceiling of the building.

If time would permit I could cite you to a number more of the objectionable features in the present creamery machinery, but the most being along the same lines as before mentioned and all go to make an unsanitary creamery.

However, I do not wish it to be understood that I want to belittle the progress that has been made by our manufctures, for it certainly has been great, but as there is room for improvements in most all industries, we cannot expect to have ours perfect, and as an assistance to such progress of perfection we have such organizations like the one assembled here, where we are meeting to learn somthing and nothing else. If where perfect we would have no need of coming here. I have troubles and I want to learn how to overcome them. I have told you what they are. How are they to be overcome? And to answer my own questions, I wish I had all the machinery that are generally kept in a creamery on the platform here, and then had all the pattern makers of these machines with me, I feel that I could do the subject more justice than I can by mere description. I could then tell them my troubles and let *them* do the improving, but since that it not at hand let me say, give me creamery machinery that is simply constructed with all parts where dirt is apt to accumulate either covered or easy accessable with waste or brush. Have all the vats so that they can be cleaned underneath as well as on the sides and with oil catching devices on all machinery so it can be carried away to such place intended and the trouble of greasy walls, ceilings and buttermakers are greatly overcome.

In conclusion, let me say to you manufacturers, let your designers or patternmakers attend our meetings and let them learn exactly what is wanted and I am sure great progress will be the result.

THE CHAIRMAN: We have about ten minutes if you wish to ask Mr. Oltrogge any questions. Somebody start a discussion.

This is an interesting paper that should be discussed. If not, this concludes our program for this forenoon. This afternoon we will have a good program and will commence promptly on time. We want everybody here as early as possible and assure you we will not tire you. There is an interesting program for the entire afternoon.

The buttermakers of the North Central Iowa Association will hold a meeting on this platform immediately after we adjourn, for the purpose of electing officers for their association. Will the members of the North Central Iowa Association please come to the platform ?

You may consider yourselves adjourned until 1:30 this afternoon.

THURSDAY AFTERNOON SESSION.

Meeting called to order at 2 o'clock by the President.

THE CHAIRMAN: We will have an address by Hon. H. R. Wright, State Dairy Commissioner.

ADDRESS.

HON. H. R. WRIGHT, DES MOINES, IA.

Mr. Chairman: The principal question nowadays before the dairy people in this state is the conundrum, Shall we have fifty creameries doing the business of the state or shall we have a thousand as we used to have? The central creamery or the local?

We used to discuss the hand separator question, but that is now a closed matter, an established fact. Fifty per cent of our creamery patrons are users of the hand separator, and more than fifty per cent of our creamery butter is made from cream skimmed on the farm. And already 25 creameries make more than one-fourth the butter of the state and the question before nearly every creamery of the state is how to hold their patronage. It is a condition and not a theory that confronts us.

Those who are familiar with the history of the changes in the manner of creamery operation know perfectly well that no system has long endured that did not give the farmer the most possible for his product does not require any extraordinary ability to foresee that that system of creamery operation will continue that not only can but does pay the farmer the most for his butter fat and the perpetuation of the local plants turns on their ability to pay more for the butter fat than creameries run on some other plan. Of course the situation is for the present different in those localities where there are no local plants and never have been, but for those localities where there are creameries now in operation, more or less sucessful, the only real question is the question of price, for the farmer will sell where he gets the most money.

There is a popular superstition that the central creameries pay two cents under New York for butter fat delivered at the railroad station. In a great many cases their prices are not only lower than two cents under New York, more often three or even four cents under the market, but they do not pay the same price at the same time in different localities. They buy for the least money that will get the cream. I am not now stating that they are doing anything that is improper or illegal.

I am simply stating the fact that they do not pay within three or four cents of the market.

They used to tell us that the central plant could be operated so much cheaper than an equivalent number of smaller plants and that the great saving in manufacturing expense would largely accrue to the farmer. It is true that a creamery making a large quantity of butter makes it at a less expense per pound than one that only makes seventy-five or a hundred thousand pounds. If we compute the expense of making butter from the time the cream comes into the creamery until the butter goes into the car, and compare the relative expense in a million pound plant and a fifty thousand pound plant, it is true that the smaller plant is too expensive to operate. It cannot compete with the centralizer. This is the reason why three hundred creameries and skim stations have been closed in this state in the last four years. But, if we compare the manufacturing expense in the million pound creamery with that in the creamery making one hundred and fifty to two hundred thousand pounds of butter, the difference is not very great. The fact that the central creameries do not now pay more for butter fat delivered at the station than these smaller creameries used to pay, seems to indicate that no great saving has been secured for the farmer.

We are fortunate enough to have some figures bearing upon the subject. The United States Census Bureau for the year ending June 30, 1900, found in Iowa 907 factories, this year they found but 657, a decrease of exactly 250 plants. Notwithstanding this decrease in the number of plants, the number of salaried officers increased from 413 to 806, 94 per cent; the salaries increased from $81,425 to $142,779, 75 per cent. The wages paid increased from $588,653 to $695,267, 18 per cent. The miscellaneous expenses increased from $153,990 to $369,497, 140 per cent. The total expenses here given increased from $824,068 to $1,207,543, or about 50 per cent, and this, notwithstanding the fact that the butter produced decreased from 71,000,000 pounds to 62,500,000 pounds, an increase of 50 per cent in the expenses to make 12 per cent less of butter. And note that the expenses named do not include expenses such as tubs, salt, color, which are proportioned to the amount of product made. That is to say, the expense of running our creameries is a half a million dollars more than it was before we had the central plants. The central plant does not operate at less expense than other creameries.

There can be no question that the smallest creameries cannot compete with the centralizers, but then they cannot compete on equal footing with any other creamery for the reason that they are too expensive to operate. But I undertake to say that a creamery of moderate size, well managed, the butter made by a competent buttermaker can pay New York prices for butter fat, delivered at the creamery, provided the quality is such that extras can be made out of it. A creamery of moderate size, a creamery making 150,000 to 200,000 pounds of butter a year, can make butter so that the expense from the farmer's wagon to the cars is a cent and a half a pound. The average local creamery makes less than this amount, at a correspondingly higher expense per pound. Now, why should not the local creamery increase its business just as the centralizer does, by taking all kinds of cream that is fit to make into butter at all. It is entirely feasible and I think, with a good many creameries, a necessity, to take all the cream that is offered in the community, make two grades of it, make it into two grades of butter and pay for it in proportion. By this means, a very large number of creameries, which now have too little business to operate at any proper expense, would secure an increase of business and reduce their expense of manufacture a full cent on the pound. If this is not done, it is absolute certainty that these creameries will be closed up by legitimate competition with larger creameries. The little cramery cannot keep up with the procession.

A well managed creamery, among other things, is a creamery whose business management is such that their butter is well sold. Some of our creameries get a premium of a cent and three quarters a pound. There are even gathered cream creameries, hand separator creameries, that get a cent a pound premium. There is something mightily wrong at a creamery where the butter does not sell for a cent above the market. The market is fixed especially to catch the incompetent creamery manager and the creamery patron is not getting what belongs to him if his butter does not sell above quotations. A well managed creamery gets the price and can pay the price for butterfat.

But there must be a competent buttermaker. I can't take time now to mention all the qualifications of a competent buttermaker but there are two qualifications that are so important just now that they may be stated here. First, he must be able to make a good grade of butter out of good material. He must be able to make a fair grade of butter out of second grade material. Second, I consider it of almost equal importance that he be able to make a good overrun without cheating anybody. If he is only a fair buttermaker the difference in quality may not be more than a cent a pound on the market. If he is getting the usual overrun of fourteen or fifteen per cent instead of the possible legitimate overrun of twenty or more per cent he is losing a cent or more a pound on his butter. The difference between 15 per cent and 20 per cent overrun in the average creamery of the state amounts to $1500 a year. If the buttermaker was losing this amount of money for his creamery by reason of slightly poor quality, the creamery would very properly dispense with his services. Why should they not do the same if he is losing them this amount of money by reason of inability to make overrun.

Suppose now this well managed creamery, of moderate size, making extra butter at a cent and a half a pound. The freight and commission will cost two and a half cents a pound more, a total expense from the farmer's wagon to the retailer's shop of four cents. The pound of butter fat that the farmer sells will make 1.2 pounds of butter. On a twenty cent market this amount of butter brings 24 cents, an amount that will cover the four cents expense and enable the creamery to pay New York prices for the butter fat, instead of one, two or three cents under the market. At this rate the local creamery can pay more for butter fat that any central creamery now does pay or can pay. And if this well managed creamery, of proper size, operated by a competent buttermaker, gets a premium on the butter as nearly every creamery does get nowadays, of one cent or a cent and a half, they have still further margin on the central plant, and can withstand not only fair and reasonable competition but unfair and unreasonable competition.

The centralizer hustles for business for the reason that a small business is no more profitable to him than it is to any other creamery operator. Why should not the local creamery manager do the same The centralizer takes everything that is offered to him. Why should not you with some exceptions do the same. I was in a town last week which has a successful creamery, yet every day in the week 1500 pounds of cream is shipped out of that town, not because by so doing it brings a higher price, for it does not but because the local creamery absolutely refuses to take it at any price. If the local plant would take this second grade cream, make it into second grade butter, it could then pay more for it than the central creamery does, and by this increase of business still further reduce their manufacturing expense. They don't have to take this poor cream, they are making enough butter now so that they pay more than New York prices for fat. But there is many a creamery that must have an increase of business such as this would be or go out of business.

The certralizers get together and talk over their business and try to get rid of competition that will do their business harm. Is there any reason why the local creameries should not do the same thing? This is an age of combinations and it is only by combining forces that the weaker concerns in any line of business are able to continue.

I am more and more convinced of the value of the local organization of buttermakers. They ought to be extended to cover the business of the creamery as well as the quality of the butter. They not only have a right to put up a fight for their business but it is their duty to themselves and to their creameries to do so. If the centralizer pays a couple of cents more in your locality than he does fifty miles away, wouldn't it do some good to have that fact brought to the attention of your people? In the long run it would.

The farmer is really the man who is going to determine what the creamery system of the future shall be. If the quality of butter made is low, if the manufacturing and transportation expense are high, and if therefore his returns are little, he will in some case quit the business; in any case he'll look for more money with some other creamery. He does not care about starters and pasteurization or high flavors or of the proper temperature at which to store butter. It is dollars he is after and the creamery that pays him the most dollars is the one that will get his product. He will keep right on bringing you the dirty sour cream as long as you pay him as much for it as you will for a good quality. But when his cream is graded and he is paid for it on the basis of what it is worth he will have every inducement to make it better. The grading of cream at the creamery and the making of different grades of butter will do more to give us better butter than all the laws in the book and the efforts at moral suasion that can be devised.

The creamery business is a part of the agricultural life of this state. The farmers are going to keep on milking cows in the future, because they must. There is to be progress in the future as in the past, but he is going to demand a reduction in the expense between him and his market and he is going to get it. No system that adds to the net expense can endure. Under present conditions the local well managed creamery of suitable size has the advantage over any other system both in regard to necessary and inevitable expense, but in regard to possible quality as well, for the reason that it is a cheaper manner of doing the business than any yet devised. I know too well that the theory and the practice are too often different but the successful local creamery of the future must measure up pretty nearly to the standard or be eliminated by the competition of some better method.

DISCUSSION.

MR. EDWARDS: I would like to ask Mr. Wright how he expects co-operative creameries to make butter from second grade cream at a second grade price, when centralizers pay for it regardless of quality?

Mr. Wright: That question sounds serious but I do not believe it is. For instance, last week I was in a village where there is a successful creamery making enough butter so they are able to pay somewhere around New York prices. They make 250,000 lbs. of butter a year. Out of that town goes every day of the week a thousand or fifteen hundred pounds of cream, and the principal reason why it goes is that ths local creamery refuses it absolutely, will not have it because it is second grade cream. The reason is, not as the gentleman suggested in his question, that the centralizer is paying more for it than the creamery can pay, because that is not true. They are paying two and a half to three cents more than the centralizer pays for any cream, and it occurs to me that creamery can take that second grade cream, make it into butter and sell it for two cents less than the first grade butter and then pay more than the centralizer for this thousand or fifteen hundred pounds of cream. That creamery runs every other day, has two men. There is no reason why they should not make five or six hundred pounds of butter a day more than they do. There would not be any additional expense, except for tubs, salt, etc. It is the little creamery that cannot meet competition. If the central creamery wants first grade stuff and second grade stuff and pays first grade price for it all, let him do it, he will get it in the neck after a while.

Prof. Smith, of Michigan: I would like to ask Mr. Wright if he knows any point where the method of grading cream is in successful operation?

Mr. Wright: I am frank to say I cannot mention the place.

Prof. Smith: That is what the theorists have been arguing, but practical men will not do it.

Mr. Wright: There issomething in that but in the instance I have just cited where the creamery does not have to have it, I say it would be possible for them to take this cream and pay two cents less for it than for other cream and still pay more than the centralizer. If they did that they would be able to make all their butter for less per pound but they, like a whole lot of other creameries, refuse it. There is no inducement for the farmer to make it better.

PROF. SMITH: We called a conference about a week ago of the principal cream buyers of the state and tried to induce them, under the auspices of the state dairy and food department, to adopt the method of grading cream. We also had some of the owners of the relatively small plants with us, and while this plan is theoretically correct those people saw so many practical difficulties in the way that they all refused to grade the cream. I think you are right but it will not work in Michigan now. Perhaps when we get them educated to it, it will.

MR. WRIGHT: That is not the real difficulty, that is that the creameries do not pay the highest price for the first grade. They are not managing with sufficient ability so as to pay this high price. They can do it and there is a whole lot that do do it, but a large number of them are trying to buck up against competition of the larger plants when they have not enough business so they could operate successfully and at financial gain if they were all alone. Those fellows, in order to get the stuff, are willing to pay a uniform price because that is an easy thing to do.

PROF. SMITH: I am willing to confess we have two things to fight, one is that the creameries will pay just as little for butter fat as they can get it for and the second is the farmer will produce just as poor cream as the creameries will accept.

MR. WRIGHT: I am not sure that the situation the gentleman suggests is one for self congratulation, as some of you seem to think. It is a condition and not a theory that confronts us. Let us get our hands into the game and fix the condition. Unless we do something, the farmers will keep on producing this low and pay for it accordingly, he will say "I can send it to the centralizing plant and get first grade out of it." The idea is he does not know the price because he sends the cream without knowing what it tests, he gets his check and thinks he gets first grade price. If they would weigh and test their cream I am sure there would not be many sending it away from home creameries, but the trouble is they do not know the value of their cream and if they think they are getting first grade price from the centralizer they are satisfied.

PROF. SMITH: There is one question I want to ask Mr. Wright, and that is are there not laws in this state of cream and corn, that upholds the hands of Mr. Wright in stopping the manufacture of so called "first class" butter from cream that is so old that it is gray headed and so rotten that it stinks?

MR. WRIGHT: Mr. Chairman, I am glad to say that in those extreme cases there is plenty of law to fix the fellow that sells the cream, but he is only one-half the guilty party. The fellow that gets it is the man that ought to get it in the neck. We have a law for the man that sells adulterated or unwholesome cream or milk, but we have no law to punish the man that takes it.

PROF. SMITH: In Michigan, we have a law that stands by the state dairy and food commissioner in this fight, but I tell you there are a whole lot of difficulties in enforcing that law. Time does not permit to go into details but you sit and think about the matter a moment and you will see a whole lot of conflicting interests that arise as sure as you begin to enforce it. From the outside you are going to make trouble for the innocent party, if there be an innocent party.

Mr. Chairman, I agree with Mr. Wright that the way to begin is with the education of the farmer. Your gathered cream hangs on this contingency. It strikes me, as I said last year, that your gathered cream, the use of the hand separator in the future is contingent upon farmers becoming fairly good mechanics and certainly clean men.

When I go down to your gathered cream plant and see you take out cream from a farmer that was instructed by an agent who sold the machine that he need not wash the machine more than once a week, and then only when convenient, that he can keep his cream until he gets a can full and gets ready to send it, until you have outgrown that class of influence, your hand separator butter is going to sell in New York; it ought to sell in New

York for a less price than the butter made from sweet cream, ripened in the proper way, but you commission men are putting out to the trade a butter that is made from this bad cream and selling it for the same price they are getting for clean goods. Why? Because there is so much of it that in the aggregate they make just as much money and I tell you this thing is surrounded on all sides by a whole lot of difficulties.

I intended to say something in my address tonight on this point, but I think it might as well be threshed out now. In Michigan we are against the centralizing plant that ships cream more than fifty miles. I went into a gathered cream plant about a month ago and saw the man receiving cream, and some of it was in very bad condition. I took the cover off a certain can and found the cream very bad indeed. I traced it back to a certain point and I visited the skimming station where it was shipped from. Then I took pains and went up to see the man who skimmed the cream. I found his separators conveniently located so he had to carry his whole milk only across the width of one stall to get it from the cow to the machine; he had to carry his skim milk only ten feet to get it from the separator to the pig that needed to consume it. That concern is making six tons of butter every week day, and every pound of it is a damage and curse to the reputation of Michigan.

By the art of the maker he has been able to inject into that cream an amount of well made starter, because the boy that makes the butter was trained in the dairy school and knows how to make as good an article as we can teach him. By the use of 20 percent starter he conceals the character of that butter. It goes to New York in fair condition but if they only keep it ten days it will be so fishy it can swim bu tthey do not keep it ten days, they rush it off to the trade.

If the gathered cream plant will be so guarded by law and so watched by a diary and feed inspection supported by law, that no unwholesome cream, shall go into the butter, I am in favor of the centralizing plant. Iwould not miss the figures which our friend Wright has given us today for anything. It is an argument that I did not expect because I have been so stupid as to suppose that it was economical to make butter in those cream plants. But only this do we find, we find that cream that has been skimmed on the Sabbath and allowed to go from station to station for four days is unfit to make butter from and that is the thing we find,— and that only. If they will take that cream and keep it in good condition, I have no fight against the centralized plant at all. The man that can make the best butter the cheapest from given material is the one that aught to do the work, whether local plant or centralizing plant,— we all agree on that.

Where does the farmer stand in this thing? I would like to have a whole milk creamery and run it; but I would want the patrons to bring the milk to it. I want to see the patrons occasionally. I want them to see what we are doing; that we are doing our share all right. I like to have the farmer come down to the creamery and look into the books if you will. It might take us a week to straighten out the things that he thought he saw, but did not in the creamery. But what are you going to do with the man that lives two hundred miles from the concern that buys his fat? Who will regulate the test? Someone in this state is trying to find out actually how much fat the producers do deliver and then how much is paid for it.

MR. WRIGHT: I do not want to leave the discussion of the matter just here because the gentleman has not told the whole story. I agree with all he says about the iniquities of the farmer that does not produce good cream, and I agree to all that and then some; but I want to tell you that the fellow that buys that cream is the one that ought to be fined. You give me a law and men enough to enforce it with any sort of degree of completeness, a law that will fine the creamery operator for receiving a pound of this bad cream, and I will guarantee to increase the quality of the butter in this state 10 per cent in the next year; but you continue the law which you have, which says that a man may be fined for selling that cream to the creamery,—but that is too big for me to tackle, if I lived to be a thousand years old I could not do anything with it that way. We cannot make that man more honest, honorable and clean by means of a law that will get after him and fine him $25, but when you have five or six hundred creamery operators and it is possible to get that fellow who is about to use poor quality of cream to make butter and fine him, he will not do business that way. That is the kind of law we want.

MR. McNARY: There is a law on the statute books to that effect. Any man that knows of a crime, the law exists just the same against him as the man who perpetrates the crime. That is the law on the statute books. If you know that I stole a horse they will hold you just the same as they do me, if you do not report that crime.

MR. WRIGHT: Did you ever know a man that was put in prison for stealing a horse that way, by proxy? You could not convict him in a thousand years.

MR. McNARY: The buttermaker at our creamery is a first class man, a gentleman in every respect. A man came to the creamery with about 75 pounds of milk more than the day before; the buttermaker asked him how it came. Well he said "That is none of your business." Well the buttermaker said he would not take a lot of milk that came from a fresh cow; one word brought on another and the buttermaker pushed the patron over. The patron came to me (they call me the "Irish Justice of Hudson"). I asked the buttermaker what was the cause of the trouble and he told me the facts; the patron did not deny it and said "I did bring some of that kind of milk in." I refused to issue a paper but said "I will have this man appear at any hour you want but you are the criminal for bringing in such milk not him." I read the statute to him which showed that in his case the lowest fine is $25, while in the case against the buttermaker the fine is down to nothing. I asked the buttermaker why he did not turn the milk out and he said that the officers in the creamery would not back him up in it. As long as you tie the buttermakers' hands you are taking up all this dirt and putting it into the butter.

MR. BART: I would like to ask Mr. Wright this: Supposing we had such a law and the buttermaker claimed he did not want to make butter out of the cream, that he wanted to make machine oil,—what then?

MR. WRIGHT: Now the gentleman is touching the difficulties in the law that I have been talking about. The difficulty in the other case is the difficulty of numbers, because you cannot get any large numbers of them and perhaps you would have similar difficulty in proving the cream was unwholesome. It is no easy thing to go into a community where nobody knows you and get a responsible citizen "pulled" for selling milk only testing 2.8 per cent. In the case you speak about you would have the same difficulty. If the man had been churning cream right along and was making all his cream into butter, it would be pretty good evidence that he intended to make buttter out of the cream. There are a whole lot of difficulties when you get a man into court on a criminal charge.

MR. FOWLER: If you are going to criticise the cream that is taken in because of poor quality, what about the poor butter that is worked over and put on the market?

MR. WRIGHT: We already have a law in regard to that. A United States law in regard to renovated butter.

MR. KNUTSON: I do not believe in two grades of butter in one factory. I have always been opposed to it. In our factory we had quite a little difficulty last Spring with hand separator cream. The first day eight or ten patrons brought in cream two days old,—bad. I opened a few cans, smelled of them and they made me sick, I put the cover on and said "Gentlemen, I cannot use it. I did not "scrap" with them or anything of the kind, and the cans were taken away. I felt pretty discouraged but I though "Let it go for a month anyhow". When the month was in I had but one cream patron; about twenty of my patrons shipped away, but a short time after the month was out they said "What do you pay for butter fat?" I told them and they said "How do you do that, it is more than market price?" I said we pay it just the same. In a few days I had three or four of my patrons back, and they are still coming back. Today I have sixteen of them. I think the better way is to let them ship away for a little while. Just be cool and use common sense. Talk to them if you meet them and you will get your patrons back without any trouble, and you get the cream in good condition.

MR. NIETERT: I presume this is a question of not what the creamery shall handle or what the centralizer shall handle, but it rises to my mind that this is a question of what the state of Iowa will produce, whether we shall produce a greater quantity of what we term "extra" butter or a larger per cent of undergrade butter as now. I presume that is the point. Now then, I have no quarrel with my neighbor if he is a centralizer and can pay more for cream or milk than I can. I take this view of it, that he probably is a little shrewder in his business and understands it better than I do, and I quietly say that I had better look around and see how he does it.

It may be true—I hope it is not—but it has been asserted that for the large amount of butter that the centralizers sell they receive as much as does the man that makes a first quality of butter. For a time and a limited time that may be true, but I believe that merit will win in every instance in the first quality of any product that has been put out. Futhermore, it has been asserted that they could work that off in a hurry, get it disposed of and then consumed by the public and still have poor quality. I stand here today to say that the buttermaker who will make a quality of butter that will hold up in the hands of the consumer after it has left the retailers' hands and stand up on his table under proper conditions in any season of the year, will never lose caste among the trade; but the buttermaker who does not look to quality but thinks rather of quantity is making a hole for himself to drop into and a grave for the spurious buttermakers of the country. I give you warning to prepare for these things. I hope and trust that all creameries, whether centralizing plants, individual or co-operative, will use their earnest endeavors to obtain the best product and to use every effort to make the best finished article out of that product.

I do not think any of us can afford to quarrel. We know this is true, that the survival of the fittest is sure to win. You say your patrons will take their goods to the centralizing plants, but I have always found it to be a fact that if the poorer stuff that came to my creamery could all go to my neighbor, and the less I had of it and the more he had of it, the sooner I could put him out of business.

THE CHAIRMAN: We will have to stop the discussion of this question. We have with us this afternoon Professor C. F. Curtiss, of Ames, who will address us.

ADDRESS.

PROF. C. F. CURTISS, AMES, IA.

Mr. Chairman, Ladies and Gentlemen: When your secretary, Mr. Kieffer, spoke to me about taking a place on this program, he suggested he would like to have me talk about cows. I take it that more of you gentlemen in this audience are interested in the products of the cow than in the cow herself, and yet the cow lies at the basis of your industry and without success there without good work there, and right methods there the industry will suffer and we cannot expect to make the progress that we hope to make in the dairy industry without due attention to this phase of the work. We have made considerably more progress, I believe, in the manufacturing side than in the producing side and in discussing the question of cows this afternoon I want to invite your attention, in a preliminary way, to the environment that surrounds some of the dairy breeds of cows in their native home.

I believe in the study of animals that it is important to examine first environment, because environment is an important factor in affecting animal life in all forms from man down, and as we advance up the scale of animal life we find environment to be a more and more potent factor with the higher animals than with the lower animals. Consequently, we will do well to give a little attention to the surroundings, the original conditions under which our breeds have developed.

In this state the Jersey and the Holstein are the leading dairy breeds; in some other states the other breeds will take prominent rank. But in looking at these breeds, we find the Jersey is a native of one of the channel islands. The channel islands are located in the English channel; there are several of them but we hear most about the Jersey and Guernsey. The group consists of Jersey, Guernsey, Alderney and a number of smaller ones. The Jersey is a native of the Jersey island. It is a mere speck of rock in the English channel, it is only five miles wide and twelve miles long; originally it was almost uninhabited. It used to be said that it contained nothing but rock, rabbits and cabbages, but it has been transformed into one of the most fertile and productive spots on the globe. There is no place where agriculture exists in as intensive and highly successful form as on the Island of Jersey to-day. It contains only about 28,000 acres and supports a population of nearly 53,000 people, a population of over 1200 inhabitants to the square mile covering the entire area, or population of nearly two thousand people per square mile of tillable land. You see what this means.

The one great industry of that Island in live stock raising is the production of Jersey cattle. In fact they have no other live stock industry of any consequence. So far as cattle are concerned, it has been a crime to import a live male of any breed whatever, simply because they consider they have the best in the Jersey line and they take no chances on contamination by the use of outside blood. These cattle have been developed for the one special purpose of converting high price food products into the most valuable dairy products. They have been developed under conditions of the most intensive agriculture, an agriculture that supports two thousand people per square mile of tillable land, an agriculture conducted in a most favorable climate, a climate in which the flowers bloom all the year long, the range of temperature being from 40 to 80; very rarely do they have frost and very rarely do they have intense heat, never what we would call intense heat here. These conditions permit of the highest development of their crops. A large part of the tillable surface of the island of Guernsey, about one-quarter of it, is farmed under glass; not so large a percentage of Jersey because of the different character of their crops, but the potato, the bean and peas, garden products, clover and the richest grains that can be produced are the chief products. The farms average only about five or six acres in extent; a farm of forty acres is an unusually large one on this island. The herds are limited, as a rule, to small herds of ten or a dozen animals and even lower than that. They are never turned out to pasture but are staked or tethered out and moved three or four times a day and given just a few feet of additional fresh grass, and then moved on and on and brought back over the same space again several weeks later when a new growth has sprung up. In that way they make absolutely the highest utility of all their products.

Those cows are carefully stabled and handled and fed with the highest attention, given the richest and choicest of feeds and every possible attention given them to produce the highest output of dairy products. They have been developed for centuries for the purpose of producing dairy products most economically. That in brief is a description of the conditions surrounding a Jersey in her native home. They are never fed heavily and abundantly as they are here, which accounts for the difference in the Island type and the American type. We often hear Jersey breeders discussing the difference between the Island or imported type of Jersey cow and the American type. In America, under our conditions, the more liberal feeding is what we have, producing a larger, somewhat rougher and more vigorous cow with greater capacity.

We prefer the American type because we consider her better adapted to our conditions, but there has been a constant drawing on the Island for new blood for the highest degree of excellence.

If we go onto the main land of Europe to Holland, and more particularly to the Netherlands, we come to the home of the Holstein, the other type which predominates in this state. There we find different conditions, different climate, that is more severe; we find land has been redeemed by the efforts of those people from the sea, around which they have thrown up dikes and a large portion of it lays several feet below the sea level yet and is protected by dikes. In visiting this country the first thing that strikes you is that it looks like all one farm. You see no fences; then you notice the fields and farms are all separated by ditches and the farms are fenced by ditches. All these ditches carry off the surplus water. Those ditches are lined with the Dutch windmills and we find them pumping up the water out of the ditches, lifting it onto higher surface and carrying it on until it gets to the sea shore and there it is pumped into the sea. This land is drained to-day in that manner. That water lies all around it at almost surface level and you have under such conditions a land that is highly productive although the climate is more severe, but this land produces largely root crops. It also produces grains and grasses very abundantly and the land sometimes produces three and four crops in a year. The cows are grazed more largely than in Jersey Island, are never staked as they are on the island. They are given the best treatment the year round; in the Spring and Fall when the cold winds are blowing in from the sea they are blanketed when they go out to pasture. When they are brought in, they are brought to a stable as clean as the dwelling in which those people live, under the same roof as the dwelling in which the people live. This stable is put in the best possible condition and it is kept as clean and as wholesome as any building that we can imagine, much more so than any dairy building which we see in this country.

These cows have been developed for a different purpose than the Jersey. The Jersey has grown up undr conditions of splendid fertility and food very rich and nutritious. The Holstein has had a more luxuriant growth of vegetation but coarser, consequently a different type has been developed. The Holstein cows are larger and seem capable of consuming, digesting and assimilating a larger amount of feed and give a larger flow of milk, but the quality of the milk partakes largely of the quality of the feed, and so it does everywhere. We have studied over this and have arrived at the conclusion that within a generation or two the quality of the feed does not affect the quality of the milk, which is true; but when you apply that to the animal and make it part of the animal's environment for generations and centuries, the quality of the food has been a factor in modifying the quality of the milk. So you have the conditions under which that cow was developed. They do not in the Netherlands grow nearly all the feed they consume or give to their animals. They grow the grasses and the roots and farm products, but they draw very largely upon our American stores for our oil meals and other grain products to supplement the products which they grow in feeding to their dairy cows.

Then again, if you go back across the English Channel to the British Islands away up on the Eastern shore of England, you come to the district in which the Short Horn breed develops, in the eastern part of England. There we find a locality quite different. It is more similar to the conditions of our own country. The land does not lie so low; it is not so immediately contiguous to sea breezes and sea influence, but is a rich, fertile valley, and before the Shorthorn breed was established there were in this valley great heavy, fleshy cattle that were also good milkers, and from time immemorial the Shorthorn cow has been the dairy cow of England, pre-eminently the dairy cow. They have paid more attention to the quality of the Shorthorn in England than we have in this country and consequently they have been better maintained.

Then if we pass on up into Scotland, farther on the West coast, we find the home of the Ayrshire cow in a thick, rather open climate in which the vegetation is scant and not of the best quality. We find in that locality a cow that is well adapted to making the best possible milk under those conditions. The Ayrshire is hardly known in this state, but in the Eastern sections of the United States and in Canada she is a popular cow. The Ayrshire cow is given the same careful, generous treatment notwithstanding the rigid and rather poor conditions under which this breed is developed.

In the central part of England, in Norfolkshire, we find the Red Poll developed under similar conditions as the Shorthorn but less productive and the products are less nutritious than the Shorthorn, but there you will find the same generous treatment.

I have not mentioned the other breeds; I have not mentioned the Guernsey because the Guernsey was developed under conditions similar to the Jersey. Recently we have commenced to hear about the Alderney, but it is now considered the same as the Jersey. So that wherever we go you may take it with you in every country there is developed a high class of dairy cows, you will find the best possible care, the most intelligent methods and finest treatment they can give bestowed on that cow. The consequence of this is when you bring these breeds to this country, no matter what breed we may prefer or expect to use on our dairy farms, that we cannot expect good results unless we give due attention to the surroundings, to the environment, to the conditions that have made these breeds. We cannot expect to maintain their original excellence unless we surround them with conditions that are equally as favorable as those under which they have developed. So it is important that we give attention to that phase of the dairy stock. I believe that is where we often make mistake in this country of thinking that if we get a herd of a certain breed or certain type or certain strains of blood that our efforts practically end there, that certain breeds or certain strains of blood must produce well because their ancestors have been good producers. There is no more serious mistake that can be made in the care and handling of live stock of any kind and especially the dairy cow than that theory, that these animals will produce well because of the conditions surrounding them in times gone by. It does not make any difference what kind of posterity we may have or what type of cow we may have, if she is not able to give the actual demonstration of her merits in actual tests she is not a good cow. The reason, I believe, that many of them do not produce well is that they are not surrounded by the right kind of treatment. This has been demonstrated by good dairy farmers who have bought cows from other dairy men and fed them well and made them produce well. It has been demonstrated at some of our experiment stations in Kansas, Michigan and others where they have bought cows in various communities in which those stations have been located, cows that were considered poor individuals, fed them under good conditions, with good liberal feed and right kind of ration, and demonstrated they were animals of superior merit that had never been recognized.

So it is everywhere; there are many of our best animals, especially in the dairy breeds, that are never recognized because of the fact that they never have had the opportunity to develop their inherent capacity. Those inherent capacities are to a large extent existing in all breeds. We hear about milking strains; there are cattle of all breeds that will milk well. The milk giving function is closely associated with maternity and we find this existing in greater or less degree in all breeds. It is much more uniform, of course, and much more strongly asserted in the breeds that have been developed especially for that purpose.

I have here some illustrations of cows of different types that we have tested and I want to call your attention to the records of some of them. (Here the speaker shows pictures and charts of different cows.)

Here is a representative of the Red Poll breed, a cow that produces 6,557 lbs. of milk in twelve months and 297.3 lbs. of butter; average test of butter fat was 3.88 per cent; the cost of producing one pound of butter was 7.3c., —cost of feed.

Here is a representative of the Holstein breed that in thirty days produced 72 3-4 lbs. of butter, about two and a half pounds a day. This cow was in milk for two and a half years consecutively and during twelve months of that two and a half years she made 336 lbs. of butter. This is a good illustration of persistency in the milking habit, and this is a type that represents the persistent milking habit. This was a large cow of great middle and digestive capacity and a cow that had this milking habit so strongly fixed that when we failed to get her to breed she kept on milking two and a half years and during the last twelve months made 336 lbs. of butter. Early in the period she made over 2½ lbs. of butter a day. That represents the type of cattle that have been produced under native conditions I have described in Holland and the Netherlands.

We will go to the other special dairy type, the Jersey. We find the cow much smaller, much finer, cleaner cut, with less capacity for consuming feed but a capacity for converting the feed that she consumes into richer product. That cow (showing picture) in twelve months gave 5,587 lbs. of milk from which we made 513 lbs. of butter. Her average test for the twelve months was 7 per cent, an unusually high percentage of butter fat for any cow, even for a Jersey. Her net profit on her milk alone for that time was $49.00.

Here is another representative of the Red Poll breed (shows picture), —a cow that, as you will notice, is thicker and more bulky and gives evidence of being more of a beef type animal than the other one, and yet her record exceeds the other one. She gave 7,229 lbs. of milk in eleven months, the test was 4.28 per cent of butter fat, equivalent to 361.6 lbs. of butter.

Now I stated that the milk habit was inherent in all breeds of our cattle. Of course it exists in varying degrees and in some much larger than others. Here is an illustration of a cow that was never milked until she was six years old, had always suckled her calves. One calf died and we began milking her. She milked so well we concluded to test her and in a year she gave 6,684 lbs. of milk that tested 3.97 per cent butter fat, equivalent to 386 lbs, of butter. Now that cow was a pure bred Aberdeen Angus cow that had not been milked previous to the time I speak of. You will notice her udder is defective. She had not a full, well balanced udder, although an udder of large capacity.

Here is another cow that was never tested and never milked until she was twelve years old. She was in a herd of Aberdeen Angus cattle and was the mother of a show cow that was exhibited in one of the show rings of this state and won prizes at our state fair. I saw the cow when she was twelve years old and was satisfied she was a cow that would give a good flow of milk. We bought her and tested her the next year and at twelve years old, the first time she was ever milked. she made 308 lbs. of butter in twelve months, her milk testing 3.86 per cent of butter fat, showing what a cow of that type will do when fed properly and tested properly for milk under good conditions.

Of course these were exceptional cases but it serves to emphasize the point that there are a great many good cows all over this country, both pure bred and cows of various grades, that would produce twice what they are producing now if they had proper care and treatment.

Here is a cow that for five or six years was not milked and in fact we began her test when she was seven or eight years old, I am not sure which and we conducted a test for four years, four consecutive milking periods , and in that time this cow made 400 lbs. of butter in twelve months. During the four years she made an aggregate of 1700 lbs. of butter. She is a pure bred Short-horn and at the present time, being dry, she weighs nearly 1600 lbs. This illustrates what a cow of that type will do for milking purposes.

Here is a cow of the same breed but somewhat of a different type. That cow has been bred for dairy purposes. In fact she is a descendent of Nora, the first prize Shorthorn cow at the World's Fair in Chicago, a cow that stood sixth in that test, that is in the Shorthorn breed, and sixth in competition with all breeds, only five cows ranking above her. This cow was sired by the son of Nora so she is a grand-daughter of this prize cow of the World's Fair in Chicago. She gave 9,326 lbs. of milk in one year, testing 4.12 per cent. butter fat .equivalent to 449 lbs. of butter. This cow has not yet been tested under most favorable conditions and I think she will easily make 500 lbs. of butter a year when tested under favorable conditions. She is a cow that is higher and more upstanding, and more of a special dairy type and less of a beef type than the other Shorthorn cow I have just shown you, with all the indications of a persistent milking habit. This cow milks twelve months and we have great difficulty in drying her off. I think if we were to milk her as we did the Holstein she would milk almost as long and perhaps maintain nearly as good a percentage of flow during the period. She has the persistent milk habit as strongly established as any cow of her breed that I have ever seen, and few cows of any breed that have it more firmly established. The ancestry back of this cow has been developed for several generations we know of and just how much farther we do not know.

Here is a cow of the same breed but of a different type. You will notice in the first place that she is in poor flesh. That cow in ten monhs gave only 3,059 lbs. of milk, but it only made 128 lbs. of butter, 3059 lbs. of milk and only 128.4 lbs. of butter. Her feed cost 18.4 cents for every pound of butter she produced. Her net loss at the end of a ten months' test was $1.07.

I was impressed when Dairy Commissioner Wright was speaking about the shrinkage in the creameries of this state. If we could have a corresponding shrinkage in the dairy herds of the state and have that shrinkage produced by eliminating the inferior cows, it would be better for the dairy industry. If we could eliminate the cows of that type and class that did not produce a profit and replace them with good cows there would be greater profit left to the man who owns those cows. That is the problem that confronts the dairymen to-day. There has been a marked reduction in the cost of producing butter and that has not reached its limit yet; we are going to improve our methods until we reduce the cost much more and I hope that we may not lose sight of the quantity. I hope we may increase the quantity. The farmer is confronted to-day with higher price feed than he had ten or a dozen years ago when these creameries first began to be established in large numbers. He has not been able in the products that he feeds into the milk, into the manufacture of the product that he feeds, to reduce the cost of production. The feed costs him about 25 per cent more, in some cases more than 25 per cent more than ten years ago. Labor costs more than it did then. There has been an increase in the expense from these sides and, in connection with that, he is farming on land that has about doubled in value in the past ten or a dozen years, so all the products he feeds into the manufacture of milk on the farm to-day have greatly increased in value and he is confronted with even a more difficult problem on the face of it than the creamery man has; he is confronted by labor and high priced land, with high priced feed and high priced labor and with producing a product that is not sold for much more. It means that he has to radically change his methods and I believe the dairy future in this state was never as bright as it is today, because I think those conditions which I mention are going to impel men to do more dairying instead of less, because it will be found that the future industry of the state under those conditions and conditions which must prevail in the future, will be a better paying feature of our agriculture than any other part of it. I believe that the high priced lands, the high priced products and high priced labor are going to make it necessary to devote a larger part of the energy of Iowa agriculturists to dairying.

I have frequently made the statement, and I have made it sometimes where it was discredited in this state, that under present conditions prevailing in this state and other states similarly situated in the Mississippi valley, that it will no longer pay to keep the ordinary grade cow for the calf she will produce. Men engaged in the beef industry are more impressed with this fact today; they are convinced of it now and, unless they have been raising pure bred herds that have an additional value on account of their breeding, these men who have been keeping those cattle for beef production in the state alone are going to be driven to develop the dairy qualities of their cattle or change their stock, or they are going to be driven to leave someone else produce the breeding cattle and buy the breeders and quit raising them here. I do not believe we are going to quit raising cattle in this state. It is very gratifying to know that we have bumper crops in this state this year, that we have an enormous corn crop, that all the crops in this state are almost unprecedented, making it altogether the most valuable crop the state has ever produced; but it is more important to know what is going to be done with them. It is more important to convert this product of the farms of Iowa into the form of the highest selling value than it is simply to raise it. We have always raised too much corn and too much agricultural products of other kinds to ship out of the state in the form of raw material, and the strength of Iowa agriculture today lies in the fact that she consumes on the farms of the state a larger portion of her products and converts them into finished products than any other state in the Union. No other state in the Union approaches Iowa in the amount of her coarse products that she converts into finished materials on the farm.

Those conditions will necessarily change the method of Iowa agriculture and we shall be obliged to give more attention to the dairy phase of agriculture than we have before, and in connection with that it is highly important that we study the matter of dairy ancestry and the capacity of our dairy stock and even learn more that we may make the most of the stock that we have. It is easier to produce beef animals than dairy animals; it is easier to produce a draft horse of a high degree of excellence than a blooded horse of the highest type; those characteristics which belong to beef animals and draft horses being substance, size and flesh, are transmitted with a greater degree of uniformity than the animals that are measured by quality such as vital force and nervous energy that go to measure the dairy cows or the value of a highly bred horse. It is easier not only to produce them but it is easier to feed them. They have not the nervous temperment, they have not that highly intensified nervous force, but notwithstanding the fact of that it is easier to produce them. Of this type, the animal that pays the best is the one that is going to be in evidence and the farmers of the state are going to give more attention to the animals that will produce well, that will milk well. Even those men that make beef production their business will not do that entirely, and perhaps not go entirely to special dairy breed but will develop dairy qualities of the stock they have, and others will make dairying a specialty.

So we are going to emphasize those qualities and we will get the highest returns in our agriculture. We have recognized the importance of this work for sometime. As the gentlemen of this association know, an appropriation was asked from the last legislature for the erection of a dairy building and the purchase of a dairy farm. These appropriations were granted, although not in full. They were rather severely cut up. The dairy building has been practically completed, the farm has been purchased, 200 acres of land near the college, and it is our intention to stock this farm with various dairy breeds for combining the capacity of producing beef and milk. We expect to make this one of the important features of our dairy instruction. Thus far most of the attention in the dairy schools and in the conventions has been given to the manufacturing side of the industry. This is entirely natural and of course it is all right, but the other side lies at the foundation of this entire industry and we feel that it is exceedingly important to conduct investigations along that line, and we will be able to begin with the cow in conducting investigations which we will carry along. This farm, consisting of 200 acres, wil be devoted exclusively to dairy stock and stock combining beef and dairy qualities, the kind of stock used in this state principally for the production of our dairy products, and instead of this state becoming less in dairy industry, instead of being alarmed by the apparent indifference in the dairy industry and decrease in the number of creameries, I believe there is ample evidence today that the dairy industry in this state is destined to occupy a higher place in Iowa agriculture than ever before, and this state is destined to be one of the leading, if not the leading state in the amount of dairy products it puts out.

I believe the conditions which have made Iowa the great dairy state are going to continue in a more intensified form and the conditions confronting us today will necessitate a greater degree of attention being given to the dairy industry. I think the outlook to the men engaged in the business, both in manufacturing and producing was never more favorable and never offered better opportunities than at this time. I thank you.

DISCUSSION.

MR .WENTWORTH: I would like to have Prof. Curtiss hold up the picture of the type of cow that made 128 lbs. of butter. While this address of Prof. Curtiss is firmly fixed in your mind, while those facts are still fresh in your mind, I want you to bring to your memory the fact that that cow, which was kept on the college farm and produced only 128 lbs. of butter, fed on dairy ration, a ration that was produced as cheaply or more cheaply than any farmer in Iowa can produce his feeds, that cow produced almost exactly the same amount of butter that the cows that are producing milk and sending their milk to the creameries are producing in twelve months for the state of Iowa. In other words, the average production of the cows of Iowa is something like 128 lbs. I think there is a big object lesson in that statement. That is the poorest cow you ever fed, if I remember, Professor? That is the only cow you ever fed that did not produce a profit?

PROF. CURTISS: We have had some others but I simply brought this along as an illustration of a common cow.

MR. WENTWORTH: It is almost the exact average of what the cows of Iowa have been doing in the last ten years in this state. It seems to me that this is the saving grace they have to draw from the professor's remarks. That type is almost the exact duplicate of what we have had in Iowa for the last ten years.

MR. ANDERSON: Prof. Curtiss stated that his unprofitable cow produced butter at a rate of 18c. per pound. What was the cost of production of butter from the best cow?

PROF. CURTISS: I failed to get that in all cases but I have it here in most cases. One of the best of the Shorthorn breed produced butter at an average cost of 6.2 cts. per pound. That cow would have made a net profit from her milk alone of over $80 after paying all expense of feed consumed and allowing for the expense of labor in caring for her, and giving her no credit for her calf. Being a pure bred animal, I think it would not be fair to take it into account, giving full value for breeding purposes, but leaving the calf out that cow would have made a net profit of $80 on her milk alone. However this was a year of comparatively low priced feeds, but she has never failed to make a net profit of $40 or more on her milk alone. We have figured the product of butter fat at the price we are paying the patrons of the college creamery.

PROF. SMITH: Where is the wedge shape. Professor?

PROF. CURTISS: She has not it there in that form. There are varying degrees of wedge shape. This cow during the period of which I give you her record produced butter at a cost of five cents a pound for feeding. The feed consumed by this cow cost five cents a pound for butter produced in that period on a record of 445 lbs.

MR. ANDERSON: Does that include the calf and interest on money invested?

PROF. CURTISS: We do not credit the value of manure, skim milk neither do we charge up labor, but the skim milk and manure would more than offset these other items, so you may say those things are taken into consideration.

MR. HENDERSON: I would like to ask Professor Curtiss if he raised that unprofitable cow or bought her?

PROF. CURTISS: She was raised for beef on the college farm.

MR. HENDERSON: I would like the professor to tell us as near as he can how to eliminate those unprofitable cows. The farmers of the state want to know. It is easy to say that we must get rid of them, but we want information as to how to get rid of them, because if we get rid of them this year in two or three years we will have some more.

PROF. CURTISS: I will answer that in a moment. This is a cow that made the high record of 513 lbs., that produced butter every year at a cost of 4.7c per pound for feed consumed. Of course these prices are not comparative in all cases because the tests were conducted at different periods at different prices of feed and different prices of product, so those prices are not directly comparable.

With reference to Mr. Henderson's question, I will say that there is no recipe or formula by which we may breed all good cows or good animals of any kind, for if there were it would be easy. We have, however, inferior cows no matter how carefully we may feed and how we may develop them. I hold this, as I stated in my address, that the cow with a high dairy penchant is harder to produce uniformly and regularly than the cow with good beef qualities, for the reason that those qualities of milk giving associate with the nervous function and vital force of the cow and are artificially developed to perhaps a greater extent than beef qualities, or at any rate they are not as easily transmitted as the other qualities; and, though you may select your breeding stock with the utmost care, you will find some cows in your herd like that one. We had a half sister to this other cow with the high record of 449 lbs., that had the same amount of Columbia blood in her veins that this cow had, and she was a failure as a dairy type of cow. Hers was a case where the inherent dairy capacity had not asserted itself. Breeders will find that to be the case, no matter what kind of stock, what kind of breed that they use, they will find animals with the very best ancestors in the way of pedigree, even surrounded by the best treatment and most favorable conditions, that will fail. The only means of combatting this is to be posted on our grades and never produce from that kind, but produce from the best and the longer we continue to produce in that way the more we will intensify the strong blood lines and favorable strains of breeding, the more uniform will be the product. So it is exceedingly necessary for the man who is keeping cows for milk especially and even for other purposes as well, to study the effects of these animals. He will find a good many will be disappointing, and if conditions are not favorable the number disappointing will be greater.

THE PRESIDENT: The next will be a recitation by Miss Inez Jackson, "A German Monologue."

THE PRESIDENT: The Iowa State Dairy Association has always been very lucky in the fact that if we were disappointed in one speaker we always had another just as good and sometimes better. We are up against that proposition again. We have had a telegram from Mr. Trow saying that he was in

Canada and could not be here, but we have with us Professor Thos. Shaw, of The Orange Judd Farmer, who is going to take Mr. Trows place on the program.

ADDRESS.

PROF. THOMAS SHAW.

Mr. Chairman, Ladies and Gentlemen: I count it an honor to be permitted to talk to the men of a state who are making more dollars per acre out of their land than the men in many other states in the Union. I must say, Mr. Chairman, that I feel a little diffident in talking to men who can do that, for it tells me as plainly as language can tell it that these men know what they are doing.

I was introduced to you to take the place of Mr. Trow, who is not here today. I would rather not, consulting my judgment and being called upon on such short notice, I would rather not take the subject which was allotted to him, but I think, gentlemen, that I can take a subject that I hope will be of some interest and profit to you. I would like to talk to you on the subject of breeding live stock on the farm. You know, farmers, as well as I can tell you, if you have thought on the subject and doubtless you have, that this is a subject that has depths in it so great that it will take a giant over his head at the very first channel, but at the same time, it is very fortunate for the farmer that it is so; also it has shallows in it in which even a child can wade.

I am not going to talk to you much about the three great laws that govern breeding, that is to say the first law that like produces like, the second law that like does not produce like and the third law or the law of atavism, that is the progeny shall be like some remote ancestor but not like the immediate ancestors. My contention is that the first law of breeding is the more prepotent of the three. I know, Mr. Chairman, that some men, and some good men, do not agree with me in that theory, but they are not going to change my mind unless they bring to me reasons different from those that have been presented to me before on this subject. I still cling to the view that the first law of breeding, that like produces like, is the strong and fundamental law, is the anchor that enables the men engaged in this business to make progress in their work. The law that like produces like means that the progeny shall be like the ancestor. The law of variation, or the law that like does not produce like, means the progeny shall not be like the ancestors. Here are two laws and they are apparently one against the other. It is as clear to me as the day light that if the law of variation were stronger than the law that like produces like, that a farmer could never be sure of making any sure progress in breeding, so I cling to the view that the law that like produces like is stronger than the other law.

I remember at the experiment station that Professor Green, the professor of horticulture, had taught the boys in his department that the law of variation was stronger than the law that like produces like; I was teaching in the dairy department that like produces like, and the boys were sharp enough to catch onto these things. They fancied I was teaching one thing and that Professor Green was teaching another and they came to us and began to reason with us about it and urged us to come together and fight it out in their presence to find out who was right, but of course we knew that would not do because neither man wanted to risk his reputation in such a contention as that.

Now having said what I have in regard to the operation of those laws, I pass on to a subject that I think will be of interest to every man who is engaged in the breeding of dairy stock, and that is the question as to how he shall choose a sire and how he can be assured before hand that he is going to get a sire of the right type. How can he know that he is going to get a sire that possesses the properties that he is looking for, or, in other words, how is he going to know that he will get a prepotent sire?

Prepotency in a sire means that that sire has power to reproduce himself in his progeny. You farmers know that sires are generally purchased when they are young and when you cannot put them to the test by observing what kind of progeny they produce. How is one of you dairymen to go into a dairyman's herd and select a sire and know almost to a certainty that you are going to get the sire you are looking for? I believe, gentlemen, that it may be done with approximate, but not with absolute certainty.

Now what are the guarantees of prepotency? You dairymen who are breeders have thought of that, or if you have not thought of it you have not lived up to the height of your privileges. What are the guarantees that are going to tell you the properties a sire ought to have, how shall you know when you see him? How shall you know when you examine his record that that is the animal you are after, I question whether a more important question has been raised today in this house than that very question which we are considering at this moment.

Now I do not need to tell you intelligent men who have looked into the subject that one of the most important guarantees of prepotency in a sire is the fact that he has been bred in a certain line for a number of generations, or in other words that he has been purely bred. Now what good does that do that sire? Simply this—it gives him an accumulation of dominant or governing properties in his composition that can be transmitted to the progeny, and the longer that he has been purely bred in that line the more prepotent are those properties going to be, so that length of pedigree is one guarantee that that sire shall have the properties which the breeder is looking after, but allow me to refer right here to a very common mistake that is made. The breeders of Clydesdale horses, for instance, in attempting to sell a sire will probably refer to the fact that that sire is descended from the great Darnley; they go back ten generations to that great Darnley but because there is Darnley blood in that sire they demand a greater price for the animal they are selling. Let us see how much of the Darnley blood there is in that sire.

Go back one generation and the progeny has 50 per cent of the properties of the first sire; the second generation he has 25 per cent only; you go on back four or five generations and the amount of blood of the sires previous to that, why, farmers, what does it amount to? My contention is that the blood of the first, second, third and the fourth sires is the controlling factor in the properties of the animal that will be purchased into a herd or flock as a sire. Now do not misunderstand me. I do not mean to say that the blood and properties beyond that are of no account, but the greatly important thing for a person to look into in the purchase of a sire is the character of the first, second, third and fourth generations. If these are good, farmers, if they have bestowed the properties that the individual desires to have in his flock or herd, he has a strong guarantee that in the purchase of that sire he is going to get the animal he is looking after.

Now I go a step further and will make this statement, that the evidence of the fact that that sire possesses the properties that he ought to have will be strongest if that sire is line breeding. Now do not misunderstand me. I am not an advocate of inbreeding, but I will say this, that if the properties of an animal can be maintained, if the useful properties of an animal can be maintained, that animal will be more prepotent as a sire if he is line bred and still more potent as a sire if in-bred. I do not think that is a good plan for farmers to practice to any great extent, because of the fact that experience has shown that men engaged in those lines of breeding after a while find the breeding results in physical determination; but if the stamina can be secured the fact that that sire has been line bred will make him more prepotent and more certain of transmitting his properties to his descendants than if he were not so line bred.

The first guarantee is the animal shall be purely bred for a number of generations and the important fact in connection with that is that his ancestors shall be noted for breeding the qualities that have been sought. The second is that the animal shall be line bred. Here comes the third—it is the question of the indications of physical vigor in a marked degree. I might illustrate that in this way,—you farmers probably have noticed a Southdown ram walking in the distance. You notice how proudly he carries his head; his ears will be erect, his eyes alert noticing everything; every step he takes denotes activity and vigor, an indication of constitution in that animal. That is one of the greatest guarantees that you can have in connection with the other properties that that animal is going to be prepotent. You get these three indications in a marked degree and I assure you in ninety-nine cases in one hundred when you select a sire with proper form that you are not going to be disappointed in the selection of that sire.

There has been a good deal said today about cheapening the cost of production in dairy products. I propose to touch somewhat, Mr. Chairman upon the same line but in an entirely different way. A good deal has been said about the low standard of the average dairy cow in the state of Iowa, and that is true of every state in the Union. The important question was put to the last speaker on this platform "How shall that state of things be changed" and he gave it a very intelligent answer, but I propose to answer it, Mr. Chairman, in another way and I think, also, in a practical way.

I am not in favor of the average farmer spending a large amount of money in getting everyday animals for an average dairy herd. I do not think he ought to do it, I do not think, Mr. Chairman, the average farmer is the man who can engage in breeding pure bred stock. He does not understand it well enough to make a success of that, and I do not mean to say by that a single word against the standard of intelligence of my brother the average farmer. The thought that I give to you, Mr. Chairman, is that there are more men who are legislators in the state of Iowa today than there are men who have been successful breeders of live stock. I tell you it takes a higher type of man, by I do not know how many degrees, to make a good breeder than to make a successful legislator. For that reason I am not in favor of the average farmer investing large sums of money in pure bred stock, and more particularly I am not in favor of the man who is engaged in the breeding of dairy cows in order to furnish milk for the milk factory, but I am in favor of getting those cows in this way,—a way I shall now refer to. Let him begin with scrub cows if he likes. I know that word scrub is an indifferent term, it may be applied in many ways. I do not use the term scrub in a derisive way at the present time. Probably a better word would be the word common.

Let me begin with a common cow. I do not care what the blood of that cow is; I do not care if the blood of that cow consists of the elements of ten or fifteen or twenty different breeds all mixed up, that would not lessen the cow one iota for my purpose if I were going to establish a dairy herd, a herd of milking cows. I would a little rather that those blood properties were all mixed up. You may think that a strange talk, but I mean what I say. Now you ask the question why,,—simply for this reason that that additional blood element added to the component elements in the make up of that cow passes rapidly in the change when the progress of upgrading begins that I am about to refer to.

At the Minnesota station we went out and purchased in the stock yards ewes that had been brought up on the range. Three years ago we took the progeny of the descendants of these range ewes to the National Live Stock show at Chicago and showed the lambs against the world and came back with first prize to the state of Minnesota. That was done with three generations of breeding. Now that that was so, was not a great surprise to me. Of course I did not expect that we would get the prize, I did not hope for that, but I did believe we could reach great excellence by a proper system of breeding, beginning with stocks with that kind of foundation.

Now you know, farmers, that editors, especially, have had this charge brought against them,—they have urged all farmers to use pure bred stocks and nothing else, and the farmer has sometimes said that those men were hired to write that sort of thing in order that the men who are breeding pure bred stock could get a good price for their animals. This is not so and does not need to be so. I do not need to tell the farmer that if he persists in using a grade instead of a pure bred sire properly chosen, that he is his own enemy and is only hurting himself. Now I purpose to show that and I call your attention to the illustration which will be made upon the blackboard.

Suppose the farmer is in search of dairy cattle. We will suppose he begins with one of those common cows that we have been talking about. We will put the letter "C" here on this side (indicating left hand side) and the letter "S" denoting sire with "H" before it, we will say Holstein sire, here on the other side. The farmer proposes to improve his herd using Holstein sires. The difference in the blood elements between these animals we will say is represented by 100 per cent. The progeny of the first cross, according to common thought, would possess 50 per cent of the blood elements of the sire and 50 per cent of the blood elements inherited from the dam. Allow me to ask you this question,—is that true or is it not true? Does the progeny in this case possess 50 per cent of the blood properties inherited from the sire and 50 per cent from the dam? It is true. That is the natural thought, but it is not true; the progeny does not inherit simply 50 per cent of the elements or properties possessed by the sire and 50 per cent of the blood elements or properties possessed by the dam, for the reason that here is a dam with mixed blood elements, here is a pure bred sire, we will say one of the best and most prepotent that can be got. Now then, it is very evident that the progeny of the first cross will inherit far more than 50 per cent of the properties of the sire and correspondingly less than 50 per cent of the properties of the dam. We cannot tell just exactly how many will be inherited. It will determine upon the relative strength of the blood of the one instance and relatively weaker in the other instance. We will suppose the progeny of the cross inherits 75 per cent from the sire and 25 per cent from the dam. You have heard the remark that the progeny of a first cross in that kind bears a close resemblance to the sire! You see how it is; it is following out a natural law of breeding that it is so. You have also heard the statement that the progeny of the second cross does not show as much relative improvement as the progeny of the first cross. That is so and for this reason; at first there was a difference of 100 per cent in the blood elements between the sire and the dam; now then there is a difference of only 25 per cent so it is impossible to make as much change in the second instance as in the first.

But suppose a Holstein sire is used again. Now then there will be about 15 per cent of the blood elements inherited from the sire leaving only 10 per cent from the dam; the same kind of cross is made the third time and there will be about 7 per cent of the sire and 3 per cent of the dam; the same kind of cross is made again and we will say two are inherited here (from the sire) and one here (from the dam). Now the progeny have inherited how many of the elements that are the properties of the sire. We get it by adding up these figures making 99 leaving only one on the other side, and here are only four generations of breeding that have been made. Now if another cross is made the fifth cross, why it almost obviates the blood elements from this side (the dam) altogether, so the animal of the fifth generation is about pure blood

Holstein, and for practical purposes in a dairy herd that animal should be just as useful to the farmer as if she were purely bred and recorded in the Holstein herd book.

Now you see, farmers, that without investing a single dollar in expensive females, but by simply selecting males from that breed and continuing to breed that way in about five generations an entire transformation of your dairy stock can be made. If that were applied all over the United States it would add millions and millions of dollars to the value of the stock in this country. But suppose that the farmer adopted a different line of breeding, the same as a good many do,—that he used a Holstein sire the first time, a Jersey sire the second time and a Guernsey the third time. It would simply mean this, that he would be going this way and that way (illustrating) and at the end of the term of years of breeding, however many years may be embraced in that breeding, he would be just where he was when he started. His animals might not be inferior, but in all probability they would not be superior.

So that the proposition of improving live stock is a very simple process. It need not involve any great expense and the great wonder to me is that when a course so simple as that can be adopted that that process was not adopted by a larger number of farmers.

I know the hour is late and I am probably trepassing upon good nature too long, so I will stop right here and thank you for the careful attention which you have given me.

THE PRESIDENT: Are there any question you wish to ask Professor Shaw?

If there are not, I wish to make this announcement, that we have a very interesting program this evening, more so than anything we have offered you yet, and I wish to ask you all to be on hand as early as possible. It is a long program and I want to commence at 7:30 tonight. We will therefore stand adjourned until that time.

THURSDAY EVENING SESSION.

S. B. Shilling, in the chair.

Meeting called to order at 8 o'clock by the Chairman.

THE CHAIRMAN: Now I hope that we can have a little better order this evening in the back part of the room than we had this afternoon. I appreciate the conditions,—I used to be back there myself and would be glad to be back there again, but it is very annoying to the speakers when they feel that only about half their audience is listening. I hope I will not be put to the necessity of calling the boys in the back part of the room "down" the way I did this afternoon.

The first number on the program this evening is a violin solo by Miss Nellie Smith Richardson accompanied by Professor Leo.

THE CHAIRMAN: We are fortunate in having this year the same as a year ago, a man from Michigan with us, Professor Clinton D. Smith, who will now address you.

PROFESSOR SMITH:—Mr. President,, Ladies and Gentlemen: Who shall come after the queen? It is not surprising what an Iowa girl can do with her bow when she has him on the string? She can almost make him speak and that is the hardest part of the whole proposition. Here I am a man weighing two hundred pounds and this little slip of a girl can do things I cannot dream of, which teaches me one thing that we are all at home in one family,—we enjoy music. Alas for that poor man, the pillar of whose soul is not moved by music, and when it is so delightfully rendered as this was this evening, it is indeed a pleasure for everyone except the one who has to succeed her her and jump from the sublime to the ridiculous, so I dread the question, I wish that I might say that you dread to have me not, but there is only one end of my speech that you will rejoice at and that is the ending.

THE RESPONSIBILITIES OF THE MILK PRODUCER.

PROF. C. D. SMITH.

It would certainly be carrying coals to Newcastle to bring from the state of the twin peninsulas, the country of cyclones and, to the state of Iowa, the land of corn and cows, any instruction as to increasing the quantity of milk and butter. It may not be out of place to discuss with you some phases of the dairy business especially relating to the quality of dairy products. I am the more inclined to do this after informing myself as to the details of the movement of butter and cheese in the trade of the world. As a citizen of America I am not angered when some other country takes the lead of us in quantity of exports but I am irritated at my own country when some other people beats us in quality and, for that reason, takes from us a desired market.

Our neighbors to the north are not slow in studying trade relations. Our conceit leads us sometimes to neglect this important duty.

Were we in California it might pay us to study what those countries borderig the Indian Ocean and the Chinese Sea might demand in the way of animal fats. In Iowa and to the eastward we are interested in the other direction and to us comes the question of the supply of a well known demand of our eastern cities for milk, butter and cheese and a party understood but scarcely felt call from the British Islands. Our Canadian neighbors have studied this market greatly to their adventage. Last year the price of butter was so high in America that a question as to the disposal of a surplus did not rise. No one cared about an English market. We had all we could do to supply our own cities. How is it today? If I can read anything of the signs of the times, your wonderful crops of corn and oats, of alfalfa and clover spell out low prices alike for the cereals themselves and for the butter and cheese made from them. Already the cry has gone up that the eastern markets have a surfeit of butter and that none but the best goods can find acceptable buyers. America is producing more butter than Americans need. What shall be done? Shall we make less butter or shall we find a market outside of our own borders? The Canadians say find the market and increase the production. Find exactly what the markets demand, what they will pay the highest price for, then make just that class of goods.

A Canadian correspondent writing to the Hoard's Dairyman says "The export this season is better than it has been for some years past. It is probably due to the superior quality of this seasons make. So fine is the quality of this years make that exporters are advising makers to keep it up to the present standard and a market for this article was assured, even were supplies from other sources more plentiful. A continuance of this condition will give Canadian butter a prestige in the English market very little of that below to the best Danish. Last week (September 1) as high as twenty-three cents was paid at some of the creameries for butter to export. The export up to the end of July shows a total of 237,533 packages, as against 151,113 packages for the same period in 1904."

What have we been doing all this time? Mostly eating our own butter at a price prohibiting export. Now comes the time when we need and must have an outlet for our surplus. Denmark has held the best English market with Canada a close second. Canada and the United States ought to furnish practically all of the butter which England imports. The natural trend of trade is between those islands and

America. Why then did the Englishman look east and not west for his butter? The answer is simple, because Denmark made a better article.

The dairyman of Iowa do not have to supply milk to the large cities, few in number but with immense populations. On the other hand they do cater to the wants of a large number of cities of smaller size. You are all interested therefore in the question of a pure milk supply. What shall be done to foster the milk trade, to increase the amount consumed?

The answer to both questions is the same. It is quality that the consumer demands. Canada is taking the market from Denmark because of the superior quality of the butter made. We are getting none of the butter exports increase 56 per cent for the same period in a single year. This means that it will increase in the same proportion next year, and, having secured the trade that Canadians will hold it against all comers.

It is this fact, among others, that has made me elect the topic of quality as my theme for consideration with you at this convention. I recognize that in a discussion of this subject a fair division of the responsibility between the producers of milk, the butter makers, and the distributing agencies ought to be first considered. Time does not allow me to discuss this phase of the subject at length. The distributing agencies, are not altogether guiltless. The railroads do not keep the tubs clean and bright nor is the utmost care used at the terminals to keep the butter cold and in prime condition for the buyers, but we have not those people here to deal with nor are their sins so flagrant.

The commission men are sinners as we shall see. We have dairy schools in almost every state to instruct the butter makers and I am sure that the America butter maker is not behind his Canadian and Danish competitors in his ability to make a good article of butter from clean milk or in correcting the defects on imperfect milk. There was much to be done along this line and much yet remains. There is much unevenness in the products of our creameries due to carelessness, a lack of cleanliness or a lack of skill on the part of the buttermaker. There is much for our dairy conventions, our dairy schools, and our dairy press to do to bring up the laggard butter maker, the careless, the indifferent, and the ineffcient generally, to the standard of the examples set by our best men, such as attend our dairy conventions and constitute no small part of the present audience.

The method of caring for the butter fat from the time it leaves the cow until packed in the tub for shipment, has much to do with the quality which the consumer finds in the product. While I lost some friends by my over-frank statements last year I am still convinced that the gathered cream system has some difficulties well night insurmountable. Theoretically the sooner the cream is taken from the milk after it is drawn from the cow, the less the danger of contamination. Why is it not best then to give every herd owner a separator? Note that we have a dairy school which teaches annually perhaps a hundred buttermakers showing them how to handle milk and cream, finding them ignorant in some important details at least, and leaving them fitted to handle so delicate a material as milk. Note again, that we need one butter maker for every two hundred or perhaps every two thousand milk producers. How many milk producers do we have at our regular or special college courses? Three hundred to every butter maker? Two hundred to every butter maker? Or even ten to every butter maker? No, not even one, not even as many milk producers as butter makers. In this convention the number ot butter makers is greater than the number of milk producers. Education in butter production in American is unbalanced in that the main emphasis is laid upon the butter maker rather than on the milk producer. If the graduates of our dairy school are scarcely able to properly care for a separator and cream where shall the milk producer appear? In the quality of the butter the maker has an important part to play but he is at the mercy of the milk producers. The more of the process we can leave in the hands of the skilled maker and the less we can leave in the hands of the untrained farmer, the better for the reputation of American dairy products. A man who makes so-called butter in a concern which receives cream of all grades and accepts it, as it is bound to do without reference to race, color, or previous condition of servitude, writes me that his product is piebald, ringstreaked, speckled and spotted as far as flavor is concerned and necessarily must be so. He writes "We make three tons of stuff per day. It is as good as I can make from cream without pedigree. I churn on Friday the cream from milk drawn on Monday morning, run through the separator unwashed on the sacred Sabbath evening, mixed hot with cream cold from the Sabbath, kept in a half barrel of water supposed to refrigerate it but so insufficient in quantity as to really keep it warm, then shipped to a way station on the main line, reaching there Tuesday night, shipped out Wednesday noon on a slow train and reaching here Thursday morning; in what condition you can imagine. I pasteurize at once, then add a starter, in amount twenty-five per cent of the weight of the cream a starter all right in quality. The butter is not badly off flavor when it leaves the factory but if I mistake not will be so fishy that it can swim within a week after it reaches the seaport."

When our dairy schools shall reach the masses, when the common farmers, the average men, shall attend the institutes and read station bulletins and the rural press when the sun of the millenium is projecting its earlist rays over the eastern horizon we may safely leave the care of the separator and the cream to the farmers. A few men in Michigan are taking splendid care of their cream on the farm. They are redeeming the gathered cream system from utter condemnation. I admit that the use of the hand separator saves hauling the milk to the factory and the skim milk back. Even more it saves the spread of tuberculosis. I assume the statement to be true that of all the hogs condemned as tuberculous at the stock yards in Chicago last year, fully 90 per cent came from dairy districts and received the disease through separator skim milk brought home from the factory worked on the whole milk plan. This to me is the chief argument favoring the gathered cream system. When it comes to quality, commend me to the system that takes the milk to the factory, separates it there and cares for the cream in properly equipped receptacles managed by an expert.

I shall omit further reference to the centralizing plants after the discussion of the afternoon. A system has been introduced into your state and into mine which increases the cost of making, pays the farmers less for fat, lowers the quality and decreases the quantity of our butter then injures everyone but the defiant owner, then impudently asks as we heard this afternoon what are you going to do about it? We shall show them in Michigan what we are going to do about it. We have a law on our statute books prohibiting the use of unwholesome material in the manufacture of any product used as human food. Our Dairy and Food Department has an annual income of $50,000. Our commission is ardent to enforce the law. As a result the centralized plant is extending its churning stations. After this year cream will not be shipped 100 miles or more but will be churned nearer the point of production. The commission will see to it that bad cream is not received. Go thou and do likewise!

Again where farmers have tried the distant plant in comparison with the offer of the local concern they are coming back to their first love. They find the naked fact better than the bare possibility.

You can fool all the people part of the time but not all the people all the time, and any system combining filth and dishonesty is bound to failure. Let us stick to the plan that gives us the best quality and the highest pay to the farmer.

Do not understand me as fighting the hand separator, but its abuse.

I have somewhat against the commission men in this matter. Does butter sell on the eastern markets solely on its merits? It does not. The commission men are said to be urging forward the butter from these large centralized plants almost regardless of quantity because of the loyer quantity and the consequent profit to them. I can hardly believe it. The consumer has his rights in the premises. He has a right to insist that at no time in the process of manufacture shall half rotten material be used.

After all the important thing for us to consider is the responsibility of the milk producer in this matter.

The quality of the butter and cheese and of the milk sold for city consumption is dependent, primarily, on the treatment it receives when it first issues from the cow. The responsibility of the milk producer even antedates this point. Whoever consumes a dairy product, whether it be butter, cheese, cream or milk, has a right to demand that it proceed from healthy cows, through clean air, clean vessels, and clean surroundings, that it be kept cold and that it be delivered at the proper time to the consumer.

Were it not for the danger of just accusation of repeating stale dogmas it might be well to begin the discussion by saying that the first responsibility of the dairyman relates to himself. It is useless to talk about cleanliness to a man who by nature, and habit is filthy. He may adopt the forms of cleanliness but will never enter into the spirit. It is the duty of every dairyman to be a dairyman indeed. He must be a man who thinks, who profits by experience gained on his own farm and gained through reading. I have no time to defend the agricultural press from accusations just and unjust. It is true that many contributed articles are written by men who dream rather than work. It is true that the columns are sometimes disgraced by production of paid correspondents who dwell in realms of imagination rather than work in fields of every day fact. While this is all true it is true that the rural press is becoming more and more a leader, the leader in agricultural problems. No dairyman, therefore, has a right to neglect this source or helpful suggestions. This may sound like cant but I must lay especial emphasis on the matter because, in my own state, the reading of papers and bulletins divides the sheep from the goats with hardly a mistake.

The consumer of milk or its products has a right to assume that the milk producer is a reader and knows the things taught by current literature. This is a business proposition and not a theoretical statement. No milk is fit to use that has not some of the brains of the producer mixed with it.

Next, the milk must be produced from sound cows. The old testament forbade the Jews to taste the blood of any animal. When we use milk we are therefore approaching forbidden ground with nothing but a membrance between the blood and the milk. If the blood or the body generally be tainted by disease the milk cannot be good. The time has come to take the bold and frank stand that no milk shall be received at creamery or skimming station, at cheese factory or city milk depot, that is not produced by cows shown to be free from tuberculosis by the tuberculin test. It is far from being demonstrated that consumption is *usually* taken into the human system from the milk, whether the patient be a child or a grown person. It is true that the doctors suspect a tubercular origin to every case of meningitis or summer diarrhoea that is found among the children of their practice, but the most observant among scientists studying pathological questions now agree that there is a possibility if not a probability that tuberculous germs gain access to their human victims more often through the nose than through the mouth. Some careless adult, afflicted with tuberculosis of the lungs, drops some of the sputum on the carpet. It dries there and either the broom or the movement of the creeping child stirs up the dust containing the still living germs, which, mixed with the air, is taken into the lungs, still vascular and receptive and through those tender membranes gain access to the lung tissue itself there to start the infection sure to be fatal unless the child is unusually healthy and well cared for. I am not willing to admit, therefore, that the cow and her owner are alone responsible for the rapid spread of the white plague. It is enough for us dairymen to know that there is a possibility of the transmission of consumption from cows to babies to compel us to see to it that there are no tuberculous cows in our herds. It is both impolitic and wicked to risk the lives of others in the attempt to save animals which are, at the same time, a source of danger to all the other animals on the farm. It is a penny wise and pound foolish policy.

Time does not permit me to quote at length the results of the interesting studies made by Doctor Parke and his colleague under the auspices of the Rockefeller Institute. Certainly no more interesting and significant piece of work has been done lately. They show that where they have had an opportunity to observe the behavior of a large number of infants, the death rate bears a close relation to the purity of the milk supply. A still more cogent factor is the care accorded the infants by their mothers. It was found that where the babies were kept clean and well cared for in the matter of clothing and temperature they were seldom ill even though the milk supply was defective. On the other hand even where the milk supply was well nigh perfect gross neglect was almost always fatal. These doctors discovered facts which are current knowledge among milk sellers, namely, that no matter how good the milk was when delivered at the door of the house, it was very likely to be off flavor and loaded with bacteria of noxious type before it passed the lips of the infant. The neglected milk bottle is the executioner of a large majority of the human race.

CLEANLINESS AND COLD.

Milk delivered to a creamery or cheese factory should receive as careful treatment as if it were to go into the city milk trade, since the quality of the butter and cheese is controlled by the quality of the milk. Let us, in the remainder of this paper, therefore, consider how the farmer is to meet his responsibility in this respect, how he is to economically manage his herd in order to produce a quality of milk that shall meet the requirement of factory or consumer.

I have spoken of the health of the cow as far as infectious diseases are concerned. Every herd should be tested with the tuberculin test and likewise every herd should be kept during the winter in a stable in which sunlight is the daily and ubiquitous visitor. The great germ destroyer is sunlight. My chief criticism of the barns I have visited is the limitation imposed upon the entrance of sunlight. Better the tumble down shed and plenty of sunshine therein than the best cement stable with 7x9 windows. Recently I have visited some round barns. They afford an inconceivable amount of room but unfortunately a large per cent of the room is never bathed in the antiseptic sunlight, especially where a large silo fills the center of the structure. I have recently visited a large rectangular barn with four rows of cows. The barn is too wide to be properly sunned.

I may be an extremist but I firmly believe that a cheaper barn is better than a more expensive one, and that a barn which provides room for just one row of cows, with the ridge pole of the barn running north and south with windows on the east and west sides, is a healthier and better arrangement than any system which huddles the cows into masses. The danger of cold has been exaggerated. Wind and rain I would avoid but sunlight I would welcome even at the expense of a lower thermometer in the stable. Several years ago a distinguished dairyman remarked that he wanted his stable so warm that in it he was comfortable in his shirt sleeves. From this remark I emphatically dissent. Where you have good cows they must eat enough to supply the requisite amount of protein, sugar, and fat for their yield of milk to have some heat as a by-product. Build the walls of your barn air-tight except where the regulated ventilator admits the fresh air and the tall cupola extracts the foul. Have the windows almost continuous but well puttied. Keep out the wind but let in the sun. Do not thrust a tightly boarded manger up against a window.

The Hoard stall,with modifications, I am about to recommend, but I should leave it slatwork as far as possible to allow circulation of air and free admission of sunlight. Until some better system is suggested use the King system of ventilation in some of its modified forms. I have come here from Michigan not to repeat a lot of well known facts but to call your attention to the fact that no man has a right to produce milk for sale or use in his own family without adopting the modern methods of keeping the cows healthy and comfortable. He is a criminal if he does. The haphazard way of doing things that was allowable and which we could wink at in the days of our ignorance can not be tolerated today.

Nor will it do for us to say that our best dairymen are obeying the laws of hygiene. The great mass of the milk consumed is produced by the great mass of the farmers, few of whom are awake either to their responsibility or possibility. It is true in Iowa as it is true in Michigan that the measure of the quality of the milk supplied to the factory is not the best the farmer can produce, but the worst the factory will receive. I am sounding the tocsin therefore, hoping to reach through you the ears of some of the masses to draw them to a better management of their cows.

ADVANTAGE OF SEEING THE PATRON.

Turning now from the health of the cow to the details of the care of the milk, I may be entering upon a territory where a divergence of ideas and methods may lead to discussion. In the first place the only kinds of stalls I would permit in a stable under my control would be the Bidwell or the Hoard type.

A modification of the Bidwell stall in use at the Michigan Agricultural College keeps the cows both clean and comfortable.

A recent visit to the farm of Mr. Lillie at Cooperstown, Michigan, revealed how the Deputy Dairy and Food Commissioner of the state, a distinguished newspaper writer, a graduate of the Agricultural college and, withal, a first class dairyman, kept his cows. I reached the barn in the early morning after the cows had been milked but before the stables had been cleaned out. (I may step aside to say that a dairyman recently insisted that the stables should always be cleaned out before the cows were milked. My experience in handling a large herd has not led me to agree to that proposition. If the herd is large enough to afford a regular caretaker night and day, I should adopt this method, but with a hundred cows or less I should stir up the manure as little as possible until the milking was done and the milk removed from the stable. I noted that Mr. Lillie was of the same opinion.) I found the cows arranged in two rows with heads pointing outward to the east and west with an alley-way running down the center of the barn between gutters, so that the manure could be pitched directly on the wagon which should haul it to the field. The cows therefore faced away from a central alley. The feeding alley in front of each row of cows was narrow, the center alley wide, forcing the cows comparatively near to the outside wall. The stalls used were a modification of the Hoard pattern with a V-shaped watering trough extending from one end of the barn to the other in front of each row of cows and under the bottom of the slanting rock which is a characteristic feature of the Hoard model. I shall not worry you with a description of the stall farther than to note these improvements.

IMPROVEMENTS.

In the first place the stall was open between the feeding alley and the manger, below the bottom of the feed rack. This allowed circulation of air and the entry or sunlight. Next there was a board hung on hinges just above the bottom of the feed rack and on the side next the alley. allowing easy cleaning of the racks. Next, a continuous galvanized iron watering trough, re-inforced by inch boards on the sides and with a wooden cover which the cows had learned to lift when desiring a drink, extended in front of each row of cows. This trough was just back of the slanting rack and a couple of inches below it.

Behind the cows a two by four was spiked to the partitions rather than to the floor and served to keep the cow clean. I am glad to report that not only was the majority of the cows clean as to flank and udder but that they all were so.

These stalls are cheap. They are easily made. Is it wrong then to claim that men have no right to use milk in their own families or to sell milk drawn from cows standing on a level floor tied about the neck or in any other way but kept under conditions which make cleanliness impossible? Have we not a right to demand that not a few dairymen but that all dairymen shall keep their cows clean by keeping them in stalls in which it is impossible for them to befoul themselves? Again, I call attention to the fact that the bulk of the milk and cream furnished our creameries is impure and that the filth comes right at this point. You and I are not blameless in the matter unless we made our protests heard by the men who use it. Is is not enough to give an academic assent to the proposition that cows must be kept clean. It is your business and mine to see that our less fortunate neighbors do keep their cows clean. It cannot be done without proper stalls.

When it comes to the milking, the method to be adopted depends on the size of the herd. Where possible a man should precede the regular milkers and, with a wet sponge preceded by a brush, so dampen the udders as to prevent the falling of hair and bacteria. The efficacy of this method has been well established. It goes without saying that the hands of the milker should be clean and that the pail should be clean in the becteriological sense. At my own creamery we try to insist that the pails and cans and tinware generally shall be first rinsed in tepid water, then washed with a brush in water containing some cleansing powder, water so hot, too, that the hand cannot remain in it. A brush is used instead of a cloth and immediately after washing the article is rinsed in boiling hot water. Emphasize the boiling. If it be in summer the tinware is not wiped but set out in the direct rays of the sun and out of the dust. Notwithstanding our warnings, in spite of our injunctions, in defiance of our rules and the rights of other patrons milk does come to the creamery in dirty cans innocent of any scrubbing or rinsing whatever and with seams filled with yellow scum weak in texture but strong in smell. The riot act has to be read to such a patron and happy the creamery that has a manager who knows how to be as wise as a serpent yet harmless as a dove.

The straining of the milk is not such an important matter but it is necessary that the milk be cooled and aerated in a clean place, free from odors. Cooling is essential, yet at our creamery milk comes in with no cooling or aeration whatever. We have no right to allow the wise patron to suffer from the folly of the careless. Our responsibility as creamery owners and managers neither begins nor ends with what is said and done at the weigh can, but does include the very manifest duty to reject all milk carrying the photograph of neglect. Do not accept it as second quality either.

Briefly stated the dairyman may injure the quality of the butter made from his milk in either of the following ways, among others:

1. By feeding any material with an essential oil disagreeable to the taste or by pasturing in fields where the cows have access to aromatic weeds.

2. By giving the cows bad water, filled with germs and having a disagreeable odor or an unhealthy quality. Cause of fishy flavor.

3. By keeping the cows in a stable, poorly ventilated. Tuberculosis.

4. By sending milk too soon after the birth of the calf, or, up to the birth of the calf.

5. By milking in dirty air or into dirty pails or with dirty hands or without properly cleaning and moistening the sides and udder of the cow; by cleaning out the stables just before milking or stirring up a dust in the stable or by feeding the cows silage or grain just before milking thereby filling the air with dust or with an unpleasant smell. By wetting the hands in milk when milking.

6. By neglecting the surroundings of the stable allowing the manure to rot in the immediate vicinity or allowing a mud hole before the stable door or about the water trough.

7. By allowing the cows to wallow in the mud or in water in the summer thereby coating the udder with dirt containing noxious germs which enter the udder through the teats and may abide there for long periods.

8. By using improper vessels for holding the milk when milking.

9. By failure to properly cool and aerate the milk and keeping it cool until delivered to the hauler and thereafter until delivered at the factory, or improperly handling the separator and cream if the cream alone is hauled.

10. By failure to properly wash and scald and sterilize all vessels coming in contact with milk.

Besides being responsible to his fellowmen and to his own conscience in all of these details, the milk producer is responsible for the financial side of his business. Today he may select his cows. He has no moral right to keep the average cow. It is his duty to select and reselect and select again, keeping but the best and breeding from the best.

Miss Inez Jackson, followed with two splendid readings, and responded to several encores. Miss Jackson's readings were one of the extremely pleasant featurs of the convention, and she proved a great favorite with the members prsent.

THE CHAIRMAN: It is getting late but we have one or two interesting papers yet and the next on the program is a man that does not need any introduction to the Iowa buttermakers, I will simply announce that Professor G. L. McKay, of Ames, is the next speaker on our program.

ADDRESS.

PROF. G. L. MCKAY, AMES.

Mr. President, Ladies and Gentlemen: I am always pleased to meet with an Iowa audience. The hour is so late that I will not attempt a speech here tonight; you have had so much talking already I do not think it necessary for me to give a long speech. I had a speech prepared for the evening but so many other people have gone over the ground that I will take up another subject.

I have been the past two days scoring the butter, which is one of the principal things that our buttermakers are interested in, the final results. Scoring butter is not an easy task. In the first place the judge scores the butter; he depends on the sense of smell and taste. There are not many butter judges; all the men who judge butter get themselves familiar with certain flavors. In the 219 tubs that have been scored here, possibly I had 219 different flavors. It is hard to find two tubs alike in the entire lot. That is due largely to the fact that the flavor of butter is largely a product of fermentation. There are certain standards that are recognized the world over in butter, a pleasant smell, a sweet taste, or in other words the butter that will suit the market here will suit the market in England or in Denmark.

Possibly the only fault I have with the American system of scoring butter is that we set our standard too high. We are in the habit of scoring butter 97, 98, 98½ and sometimes 99 and we do not leave enough margin for the man to work up to. In Denmark the system is to score, using the score of 15 as perfection. I was there during one of their scorings and the highest score that was given at that time was 12 1-2, which would be equal to 75 under our present method of scoring butter. I did score one tub of butter here 73 and I expect that man will score me.

The average of our butter at this time of the year is not as high as we would find it in June or under natural grass conditions. The reason of this is that many of the makers are changing from the grass to the dry feed conditions, and starters do not work the same, the temperature is changing and the result is the makers have not changed with the conditions. It takes a little time to get adjusted.

Another great fault I have with our system of scoring butter here is the method of picking out a winner. I would prefer classing the butter,—say Class A all butter scoring 97 and pay the premium pro rata. Butter scoring 97 I would put in class A, butter scoring 95 I would put in Class B, butter scoring 93 (which is extras) I would put in class C. In the final contest in scoring butter, we bring up here probably ten tubs of butter and there is practically no difference; if that butter were placed on the New York market it would sell for the same. The butter is practically the same but under our present method we have to take a first, second and third. We pass up and down that butter and probably work hours to find which is the particular tub we think the best, and after we get through that is only the opinion of the judge that that particular tub is the best. Possibly pass another judge along the same line and he would pronounce the whole lot first class; he might pick the first tub or the second tub as the winning one. I think the practice of giving a gold medal, or a silver medal or anything of that kind is wrong. If three tubs score alike, give them the same prize. We have tubs that score 95 and a number that will run the same at 93, and it is only reasonable that we would have the same result at 97 or 98. Once in a while there stands a tub out from the rest, that tub we might score as a grand prize.

In taking up Professor Smith's argument about building up our export trade, in the United States we manufacture 1,500 million pounds of butter. This butter or the milk furnished for this butter comes from ten million cows; it is produced on four million farms, furnishing employment to nearly one-tenth of our population. The value of this butter is three hundred million dollars, or five per cent of all our agricultural products. Of that enormous quantity of butter we make, 94 per cent is consumed at home, leaving us only 6 per cent for export. Under the present conditions if we can keep up the standard of our butter, it will only be a matter of time until we import butter unless we increase the present make of butter. That question does not bother me as much as keeping up the standard of our butter to extra at the present time. I tell you I am seriously troubled about the condition of butter in our own state.

In the state of Iowa we make about one hundred forty million pounds of butter. That includes the butter on the farm and in the creameries. Figuring on the basis of 20 cts. a pound, there is twenty-eight million dollars. I am satisfied, feel confident that with intelligent education we can double that amount of butter without keeping any more cows. We have at the present time two state inspectors giving instructions in buttermaking. If we had three or four or five instructors going through this state giving instructions to the farmer, testing his cows, weeding out poor ones, giving instructions in feeding and the care of milk, the amount would be doubled. But we have met a serious condition in the dairy business in this state. I don't want to say anything that will offend the centralizing people, but there is one system that has been inaugerated in this state during the past two or three years that should be condemned in the strongest measure. I am referring to the so-called "cream station." There are men buying cream in this state, butchers, blacksmiths, draymen, who have never had any training for that line of work. The result is they are not competent to judge the quality of cream and all kinds are taken. The principal interest the man has is to get so many pounds of butterfat. The result is if we go through this state in the summer months, you will find in some cases where cream is so decomposed and fermented that actually the seals are broken on the cans and the covers forced off and the cream is running along the platform. It is impossible for any, body, no matter how skilled a buttermaker, to produce a first class article of butter from such cream.

State Dairy Commissioner Wright recommended the adopting of classification of cream, putting the bad in one lot and the good in another. I think that system is entirely wrong. What the creamerymen in this state want *to do* is to get together and reject all poor cream. I do not mean by poor cream, cream that is a little sour, because we have to sour the cream before we churn it, but I do not believe in a system of taking in bad cream and placing it on the market. We have been for years fighting oleomargarine or butterine and in the judgment of a good many people oleomargarine or butterine is superior to a lot of the so-called "butter" we are making at the present time. I tell you this is a serious question. We have got to get out of the rut and get on a highre plane, and we have to endeavor to make a grade of butter that will go extra at least—93. I believe the quality of our butter has deteriorated at least 25 per cent during the past two or years years. This is largely due to the introduction of the handseparator. Now I am not condemning the us of the hand separator, but under the present condition I believe it is impossible for the man with the hand separator (I believe it has been thoroughly demonstrated in this contest) to score as high as the man who has the whole milk. One of the principle reasons for this is that on the farm the average farmer does not have hot water, he does not have steam. Even if he washes his separators twice a day he washes with cold water. That does not destroy the putrefactive bacteria that comes from the cow's body and legs. The result is the milk and cream is inoculated with undesirable bacteria.

I believe it is possible to make a good grade of butter with hand separator cream where it is good and where you have used a large starter to overcome those defects, but at the same time I do not think it possible for a man with hand separator cream to go into a contest and win over a man with whole milk, because the man in a whole milk factory has the privilege of rejecting milk; he has the separators and everything thoroughly cleansed; he knows what his conditions are, so the result is he will beat the other man every time; but if we make butter which will score 93, which is Western extras, that butter will sell to the average consumer exactly as well as butter that will score 95.

I believe that I have covered the few points that I wanted to make and thank you for your attention.

EDITOR'S NOTE: We publish following the original paper prepared by Professor McKay.

THE CREAMERY INDUSTRY.

PROF. G. L. MCKAY, AMES, IA.

During the past year it has been my privilege to travel extensively through practically all parts of the state, and in going from place to place I cannot help but notice the progress in one locality and stagnation in another. The amount of butter made has greatly increased whether the statistics furnished by our good dairy commissioner tell us so or not. A great deal of cream is shipped out of the state which is not accounted for, therefore it is about impossible to get reliable data.

It is not surprising that dairying is on the increase owing to the advance in the price of land in recent years. The farmer that succeeds must produce more economically now than when land was worth only $30 or $40 per acre. Dairying, more than any other form of commercial activity adds to the wealth of a nation. One chief reason for this is that butter forms a large part of the output; and this butter takes practically no fertility from the soil. The elements that go to make it have been drawn from the air, sunshine and the rain. It is no wonder then that every nation in the civilized world is trying to build up its dairy industry.

I recently heard one of our congressmen say that the dairy and egg production of the state was of greater value annually than all the gold and silver produced in the United States and Alaska. Which is true.

Very few have any conception of the magnitude of the dairy industry of the country. The butter made annually in the United States somewhat exceeds 1,500,000,000 pounds, and requires the milk from about 10,000,000 cows. These cows are kept on something like 4,000,000 farms and furnish occupation, wholly or in part, for about 7,000,000, or nearly ten per cent of the population. The total value of the annual output of butter is nearly $300,000,000, which is a little more than five per cent of all the agricultural products of the United States. Considered as a crop it is exceeded in valuation only by corn, wheat, hay, forage and cotton. More than half this amount of butter is produced in seven states, and general agriculture is carried on in practically all states. This magnificent state of Iowa has the honor of producing more butter than any other state in the Union and yet dairying is practically in its infancy.

Of the enormous amount of butter produced in the United States 94 per cent is consumed at home, leaving only 6 per cent for export.

With our constantly increasing population it is only a matter of time, if the quality is kept up to the standard of extras, until we will be compelled to import unless we greatly increase the output. From the statistics furnished by the late report of the dairy commissioner it is approximately estimated that the annual make of butter for this state is 140,000,000 pounds, this includes butter made on farm and dairy and is valued at $28,000,000. By intelligent breeding, feeding and caring for the cows properly I believe it possible with the same number of cows to produce twice this amount of butter.

For some unexplained reason, practically all the work done in dairying has been on the manufacturers side, while the producer who is the mainstay of the business has been neglected. We have in this state two traveling dairy instructors and they are both men that we have reason to be proud of, and we could use half a dozen more along the same line of work to great advantage. Now if we could have about six good, reliable men in this state to test herds and give information on feeding and breeding to farmers, what a wonderful upbuilding it would be to the dairy industry.

It is true that some of our Experiment Stations have done good work in milk production, but many have worked on such a small scale, keeping a few cows under abnormal conditions in expensive barns, that their work has not appealed to the practical farmer. The value of any experiment depends upon its adaptability to general use. We as dairymen do not sufficiently organize and keep the importance of the dairy business before the public. When we take into consideration that the value of the Iowa dairy products, including cows, calves, butter and cheese, is about $70,000,000, we can realize the importance of the dairy industry of the state, yet in looking over our leading agricultural journals it is very seldom that we notice a cut of a good dairy cow or sire, while on the other hand we invariably find a large cut, generally on the first page, of a beef animal. In the back part of the paper you may find a few notes on dairying. There is certainly very little encouragement given to the dairy people by such a paper.

The business man, however, looks at dairying from a different standpoint. This is well illustrated by an interview given by a representative of the Harvest Machine Trust sometime ago in which he said that it was his custom to learn whether the prospective buyer depended upon grain and hogs alone for his income, or milked cows. When he has ascertained this he knows how much cash in hand he will get and how much credit he will be forced to extend, as farmers who keep cows have been turning in 75 per cent cash and 25 per cent in notes, while farmers who are devoting themselves to grain and hogs and "haven't time to milk a cow" are turning in 25 per cent cash and 75 per cent in notes. The harvester collector is simply accusing the Iowa farmer of a neglectfulness that comes close to being "shiftless." He is saying over what everyone knows when he puts the cows and the cash together. Hard times affect the dairy section least of all. Crop failures do not bring general disaster to a dairy farm as they invariably do to the corn and hog farmer. Corn, cows and hogs are the three graces of Iowa prosperity. Any combination that neglects the cow needs revision.

With all the bright prospects for the dairy business there is growing up in our midst a condition of affairs that is threatening the very life of the dairy industry. Some two years ago a system was inaugurated by some of our creameries which permitted grocers, butchers, blacksmiths or most anyone else to buy cream and test the same without any training for this kind of work. The result is that cream comes in all conditions to the stations and it is a common thing during the summer months to see cream at stations, waiting to be shipped over the country, so decomposed and fermented that the seals are broken and covers are forced off the cans. It is impossible to make a first class quality of butter from such cream. No one would think for a moment of constructing a good house if the raw material was faulty. Then why should we attempt to make first class butter from decayed cream?

We have been for years fighting oleomargarine and butterine yet in the judgment of many these are preferable to butter of the kind just referred to. If we expect to successfully battle with oleomargarine we must keep up the standard of our butter, and this largely lies in the hands of our commission men. There is not enough distinction made between good and poor butter to reward the maker and patrons for the extra efforts required to keep up the grade.

Some years ago when examining butter in the English market I found a variation in price of five and six cents per pound when there was only a difference of a few points in the quality of the butter. I could not imagine what would be the difference in prices if they had to contend with the different grades of butter we have here. I have at home now a tub of butter sent in by a certain creamery where they maintain they lost thousands of dollars during the past summer, owing to a peculiar flavor that developed after pasteurization of real old and sour cream. Some people have an erroneous idea that pasteurization is a panacea for all defects in cream. Pasteurization does not destroy the flavor that is already present in decomposed cream, but it does largely destroy the germs that produced this flavor. This reminds me of the colored man talking with his lawyer who was consulting him about the crime he had committed. The lawyer remarked: "Why, they cannot put you in jail for that," but the colored man said: "My Lord, man, they've got me, I am already in jail." When this flavor is already in the cream it cannot be removed by pasteurization. Every loss that is sustained in manufacturing this kind of cream is a great injury to the dairy business.

The question then naturally arises, what is the remedy for all these defects? I would say, shorter hauls for cream, better and cleaner cans for transportation, shipping of cream at least three time per week, cooling of each lot of cream after separation before mixing with previous lot, thoroughly cleaning separators after each separation, and keeping cream where surrounding atmosphere is pure.

It is possibly true that the quality of our butter has deteriorated at least 20 or 25 per cent during the past two or three years, owing to the introduction of the hand separator, but this should not discourage us as every change that comes in any line of business makes it necessary that the people should rise up and meet the emergency. While I do not think it possible that the time will ever come when just as fancy a grade of butter will be produced from hand separator cream as from whole milk, I do think it possible to make a good grade of butter from hand separator cream.

There should be a better understanding between the patrons and creamerymen. When patrons thoroughly understand that it is impossible for any creameryman to produce a first class article from poor cream, we will hear less complaint about poor butter.

THE CHAIRMAN: I am sorry that it is so late that we will have to omit the discussion.

The next on the program is a baritone solo by Mr. Fuhrmeister after which there will be one more address and I hope you will all remain with us to the last.

Solo by Mr. Fuhrmeister "The Anvil Chorus".

MR. NEITERT: I observed this afternoon when our president appointed the legislative committee, out of modesty he neglected one more point. I presume that through modesty he left out a name, which was right and proper, but I now wish to make a suggestion and hope it will receive the hearty endorsement of every member here. I move that the name of our worthy president be added to the legislative committee. Motion seconded and duly carried.

THE CHAIRMAN: The next on the program is a paper on "Testing of Cream and Milk" by Mr. W. S. Smarzo.

TESTING OF CREAM AND MILK.

W. S. SMARZO, MANCHESTER, IOWA.

The testing of cream is a matter of great importance, both to the dairymen and creamery companies. We talk of buying and selling cream; but, as a matter of fact, it is not the pounds of cream which are bought and sold, but the pounds of butterfat which the cream contains; and the testing of cream is to determine the pounds of butterfat contained in such cream. Hence, it is just as important that the method of testing cream be right and just as it is that correct weights be used in weighing any article which is sold and bought, and it is just as necessary that the various processes used in testing be correctly and accurately done, and that the scales used in weighing be in order and correctly balanced. While the methods in testing cream are not complicated or difficult, it is rather a delicate process, because only a small sample is taken to be used to determine the per cent of butterfat, and therefore it is important that the person making the tests be trained and efficient in order to do accurate work.

It is a fact that many of the test operators are becoming very careless with their testing, which is causing much dissatisfaction among the patrons. I am afraid some of the creamerymen are departing from some of the rules for operating the Babcock test, as prescribed by the standard works on the subject. In many cases the test is read lower than the instructions would warrant and in others the method of sampling and measuring into the test bottles are modified in one way or another.

The three important points in making tests are: (1) a true sample of cream; (2) An exact quantity of the sample in the test bottle; (3) Reading the test accurately. These statements seem simple enough, but are more complex in actual practice.

Cream arrives at receiving stations and creameries in various conditions, and there is something of importance to be noted, if the patron has used skim milk or water to flush out or wash out the last of the cream after separating. In most cases this water or skim milk would be in layers on the bottom of the can. The portion of the richest in butterfat is on top and there is a gradation which varies with every inch of depth from this richest cream on top down to the water or skim milk.

The cream may be thick because of its richness in butterfat; it may be thick because it is sour, or it may be thick from age. Now, the first and most important thing in getting a true sample in any of these cases is to make the cream uniform throughout in richness and in physical condition. If this is not done, the first step has gone wrong and every succeeding step will be wrong just to that extent. This uniformity of cream can be best obtained by pouring or stirring. It never can be done by shaking. Pouring from one can to another is the best way. Good results may be had if the can is not too full by using a stirring rod. This rod should be made of good heavy wire, with a disk of tin, three or four inches in diameter, soldered to one end. But stirring is not so good as pouring and the safest way is to pour the cream and then use a stirring rod a moment in addition. These methods will answer in nearly every case, except when the cream is so thick it will not pour. In this case, the cream must be warmed so that it will pour. Unless this is done the operator will have to guess at the richness.

We find many creameries that are careless about their composite sample milk and cream jars, allowing them to stand uncovered. They should have a perfectly tight cover to prevent evaporation. The care of composite samples is important and they should receive good care. This is one of the places where the richness of the patrons' product is determined and should receive the best of care, so the farmer may get accurate returns.

Cream should be tested after each delivery. It is the most satisfactory, for the reason that the cream is usually in good condition to test, and there is no chance for loss by evaporation.

The reading temperature of fat in a Babcock test should be 120 degrees F. When it is read at this temperature, it is understood that we get accurate reading.

In preparing cream samples for weighing into test bottles, the samples should be heated to 100 degrees F. or until the cream is quite fluid. Then pour from one cup to another until uniform. If milk samples are heated, to mix the cream thoroughly through the milk, the milk should be cooled to 70 degrees F. before measuring into the test bottle. Unless this is done, you will not get accurate measurement. Milk and acid should be at a temperature of about 70 degrees, when mixed.

For making cream tests, where 9 grams of cream are used, add equal amounts of acid and mix well, and fill bottles at once to bottom of neck with water at 120 degrees F. Then whirl the tester for five minutes at as high rate of speed as bottles will stand. Then add water at same temperature to bring fat within scale. Whirl two minutes, keeping temperature at 120 degrees. The cream test should be read from center of meniscus to bottom of fat column.

THE CHAIRMAN: The next man on the program is one who needs no introduction. He is a man who has been with us always to advance the movement of the dairy industry in this state, and I have the pleasure of presenting to you Mr. E. M. Wentworth, of State Center.

EDITOR'S NOTE: The convention here listened to Mr. Wentworth's paper, which we regret we are unable to publish, owing to same not being in our hands at time of going to press.

THE CHAIRMAN: This concludes our program for the evening and we will stand adjourned until tomorrow morning at 11 o'clock. We have an exceedingly interesting program for tomorrow and want everybody to stay that possibly can.

FRIDAY MORNING SESSION.

NOVEMBER 3, 1905..

Vice-President W. B. Barney in the Chair.
Meeting caled to order at 11:15 by the Chairman.

THE CHAIRMAN: I think our association has been particularly fortunate this year in the large number of good addresses we have been able to give you. Now because this is the last day we would not have you think we have nothing left. In fact, we have some of the best to come on this afternoon and this morning, and I now have the pleasure of introducing to you a gentleman who has perhaps done as much for the dairy interests in Wisconsin and for the dairy cow as any other man in that state,—Mr. W. J. Gillette, of Rosendale, Wisconsin, who will address you.

THE PATH OF THE COW.

W. J. GILLETT, ROSENDALE, WIS.

Mr. President, Ladies and Gentlemen:—I feel some little delicacy at this time in saying anything upon the subject of dairying to the representative dairymen of the state of Iowa; a state that, according to our last statistics, led any state in the Union in the production of butter, with a yearly product valued at over $14,000,000; a state, the number and value of whose milch cows, ranks second only to the great Empire State of New York; a state whose natural resources are unsurpassed by those of any state in the Union; and a state that has attracted the attention and won the admiration of every lover of agriculture.

I come to you, however, from a sister state in whose agricultural achievements we naturally feel a just pride; a state that also claims some supremacy in the matter of dairy husbandry; and I come to you with no apology to make for my love of rural life and the old farm;

neither do I yield to any man my admiration for the grand old dairy cow and I am glad to be with you upon this occasion.

"From 'Plymouth Rock' to the setting sun" we note evidences of the traditional trail of the cow. New England ministered the initiative in dairy husbandry, and the westward course has been steady, unswerving, unceasing, and the "path of the cow" has led us over the prairies and the plains: it has penetrated our forests all in their primitive state, and man's curiosity and instinct has followed this trail in its various windings, so there is in reality, not only a figurative allusion but the deepest sentiment associated with "the path of the cow."

Agricultural interests have followed civilization from the "lands of our Pilgrim Fathers" to the Pacific waters which have served as a barrier for further extension, and animal husbandry has followed agricultural expansion to its most extreme borders.

History tells us that "Old Put" left his oxen yoked to a New England plowshare to accept a commission upon the battle fields of the Revolution, and the thought suggests that it was in reality the sons of the cow that supplied the muscle to first turn the sod of virgin soil. It was no other than those sturdy sons that hauled the prairie schooner westward, far beyond the fields of Putnam's agricultural operations. And, indeed, it was no other than the matronly cow that kept apace with the procession, grazed along the trail and supplied the milk to rear the babes, who were destined to awaken to a realization of the importance and magnitude of American agricultural interests.

In fact the dairy cow has gone on and on, perpetuating her kind, feeding the world, broadening your possibilities and mine, and acting a most important part in agricultural expansion and prosperity, as well as becoming the foster mother of the human race.

Agriculture and our rural districts turn the wheels of every manufacturing institution on the continent; agriculture has founded and nourished our great cities, which have sprung up and grown almost beyond our comprehension; agriculture has caused our lakes and streams to be converted into great water ways for transporting and distributing the commerce of the world; and the "old cow" was one of the parties and pioneers who laid the foundation for greater possibilities and advancement in agricultural resources.

When the dairy industry of this country is stifled, agriculture is depressed to a sad realization of its importance, and when agriculture is depressed the whole commercial world feels the shock, and so I say, much of the growth and advancement of our rural interests can be traced to the dairy husbandman through the good offices of the cow. And so I say,America owes a lasting debt to the dairymen of the United States. Much for his dictation and endeavor in shaping the destinies of our rural disricts and since improvement in our dairy herds must emanate from the pure bred dairy herds of the country, our dairy farmer owes the same debt to the dairy cattle breeder, whose untiring efforts have stood as a valuable exponent for the maintenance and improvement of dairy performance in the cow.

The first office of the cow was to produce but enough milk to supply the needs of the calf but through man's efforts in breeding, selection, and training we have today the distinct dairy breeds, the modern dairy cow. She has been produced by no element of chance but is the result of well directed aims in breeding, the intensification of characteristic dairy qualites, and the successful mixing of agencies that produce the proper blend for practical utility and dairy ability.

The Holstein-Friesian, Jersey or Guernsey pure bred sire has been to the dairy interests what the Short Horn, Angus or Hereford pure bred sire has been to the beef producing interests, when crossed upon the cattle of our western and southern ranges, or what the pure bred draft horse has been in improving the offspring of the western bronco. all of which furnish an excellent illustration of the importance of our pure bred animals and their value for the purpose of grading up.

Now when we consider that a large per cent of the dairy cows in existence, are kept at an actual loss to their owners, we are led to inquire into some of the reasons. In the first place a large per cent of the cows used for dairy purposes are not adapted to the purpose for which they are kept, and in the second place. many never have the opportunity of showing their money earning capacity from the fact of being under-fed neglected and through an indifference and improper management on the part of the owner; and oftentimes when adversity closes his talons upon the resources of the dairy farmer. he himself is to blame by not giving to his business the attention. study and devotion that any other business would require to make it remunerative and successful.

There may have been a time when the conditions of Iowa and other states of the middle west afforded a place for the dual purpose cow but if so conditions have changed and the time has passed and gone, and the dairyman who is using the beef sire with the idea of producing a little milk and raising a little beef is neglecting favorable opportunities and standing in the way of his own financial advancement.

Instead of keeping a dual purpose cow to yield forty dollars worth of milk a year. why not feed the special purpose dairy cow that will yield eighty dollars worth? Instead of a dual purpose cow to raise a steer which, at two years old will bring forty dollars. why not keep the special purpose cow that will raise a special purpose dairy heifer, which at two years old wil produce a calf. convert her food into milk, and herself command as high a price upon the market as the steer of the same age?

It is certainly impossible for a cow to be two things—a first class beef animal and a most profitable dairy cow, because the functions are widely different and the characteristics continually at war with each other.

At the present high prices of our farm lands I fail to see how we can afford to allow. only in an incidental way. the element of beef to creep into our milking herds and force us to compete with the beef producing interests of the milder climates of the south and west. where lands are cheap and winter stabling is unnecessary. In saying this I mean to offer no disparagement to the man who wishes to grow beef upon these high priced lands, though I do predict, that the production of beef in these sections must eventually be superceeded by the dairy cow.

And again, the fertility of the soil of our grain growing sections can not long stand the bombardment of continual cropping, and how often do we notice an expression of hunger plainly stamped upon the surface of our lands; of soils hungry for the fertility of which they have been robbed; soils, where rain and sunshine and nature exerted their every influence to bring an abundant harvest, continued peace and profit to the tiller of the soil, contentment and happiness into the rural home?

We find no such conditions in those districts that have followed in the traditional path of the dairy cow, and these are the sections that today, stand out boldly, as an exemplification of the highest ideal of agricultural thrift and prosperity.

The reason for this is found in the fact, that the crops of the soil are milled through the cow and the product hauled to market, tied up in the smallest possible package, in the shape of butter or cheese. She nips our grasses, consumes our grains and forage crops, and converts them into a product that is sought the world over as a staple article of food, and yet she returns to the fertility of the farm a large percent of those ingredients found in the food stuffs she has consumed, and when the dairy farmer buys a ton of wheat bran to feed his cows, he gets nitrogen, phosphoric acid and potash valued at $12.30, as compared with the price of commercial fertilizer, or $12.30 of the fertility of the farms of Kansas, the Dakotas and other wheat growing states; when he buys a ton of cotton seed meal he gets $26.16 worth of the soil fertility from the cotton plantations of the south; a ton of oats $6.70, a ton of corn $3.66, or a ton of clover hay $7.50, and yet, as alarming as it may seem, when he hauls these feed stuffs back to market in the form of butter, he parts with fertilizing ingredients to the value of but 42 cents per ton and so it seems that eventually the dairy cow must come to the rescue of many of our run down farms that are fast becoming exhausted by continual grain raising.

Some of us are dairymen of a natural born instinct; some are dairymen with a knowledge acquired through study, observation and practical experience, and others are dairymen as they would be anything else, in name only. As in everything else, some are successful, others unsuccessful. Some of us fail because no branch of animal industry appeals to our fancy and because a dairyman's occupation is thrust upon us through force of circumstances, the vocation being distasteful and disagreeable, but more fail because of looking upon the business too lightly and not giving it the thought and study it requires. There is yet much for us all to learn and there is as yet plenty of room at the top of the profession. At the top means a vocation remunerative and pleasant, but at the bottom a life of drudgery and financial embarrassment. The dairyman's sky is not always clear, neither need it always be cloudy if he will take a survey of his own conditions and try to cultivate an acquaintance with himself.

The idea that anyone can meet with success in dairying by simply moving in that direction is a great mistake for as in any other successful enterprise, it takes head work, energy and push, and a thorough knowedge of the subject in order to reach the best results. In fact the inside of the dairy cow is a very dark place, and so intricate the silent working machinery that our search lights have failed to disclose many hidden secrets. However, from experimental work and scientific research we are able to make valuable deductions and have found that certain kinds of food are used by the animal to make milk, bone and muscle, while other varieties tend to produce heat and fatty tissue, all of which give rise to the great subject of economic and scientific feeding. Much has been written concerning the compounding of well balanced rations for dairy cows and much valuable literature is available upon this very important subject that merits the most careful consideration of the dairy farmer of today, so there can be no plausible excuse for him not becoming a student in his profession if he has the inclination.

The dairymen of the middle west can better existing conditions by better feeding and care taking, by closer selection and by better breeding. By better feeding I mean the more liberal use of a well balanced milk producing ration. The cow utilizes her food either for the elaboration of milk or the taking on of flesh, and she yields nothing in either direction except by food taken in at the mouth. If of a dairy temperament it is used for the secretion of milk and, up to the limit of her capacity, she will respond in the milk pail in proportion to the amount supplied at the feed rack, hence if it pays to feed at all it pays to feed liberally, quite up to the limit of her capacity, and it will be generally noted that it is the persistent and not the spasmodic liberal feeder that scores the best results. But there is another point involved in this feeding problem that necessitates the feeder in knowing the different individuals in the herd. No two cows are constituted with exactly the same dairy temperament. If some become too much reduced in flesh, the remedy will not necessarily be more feed but a reduction in the amount of protein and an increase in the amount of carbohydrates, and on the other hand, if some become too fleshy, an increase in the protein and a reduction of the carbohydrates is advisable. Many cows will be found, however, that will yield but little milk and take on flesh regardless of how the ration is balanced. The composition of the feed has a great influence even with such animals, but they should be eliminated from the herd for they will be found wanting in the balance and so the importance of closer selection is suggested. The dairy farmer has a friend for his financial advancement in the typical dairy cow and he has two more friends in the Babcock Tester and the scales that hang in the cow barn, which with little mathematical calculation, will show the money earning capacity of the different members of the herd, aid in drawing the line between profit and loss, and afford advantages in weeding out and selection that we can not well do without. It is simply a business proposition for the dairy farmer to know with which of his cows he can exchange his food stuffs for her milk with a margin of profit for himself.

The prevailing prices of dairy products in the United States during the past decade has stimulated our dairy industry but on the other hand the corresponding high prices for our concentrated food stuffs has, for a wider margin of profit, made the matter of closer selection and improved producing capacity in the dairy cow imperative.

I have spoken in flattering terms of the dairy cow and her relation to agricultural advancement and prosperity, but even if every farmer in America wished to engage in dairying, this fact would not increase the number of existing cows, and if every dairyman wished to purchase better ones, it would not increase the number of good cows a single animal, and since selection only tends to weed out the poor ones, if there is to be any general improvement in dairy function it must come through breeding as a means of grading up.

I believe it both possible and practical within a very short time, with proper care, the more liberal and intelligent use of food stuffs, and the use of the pure bred sire of some of the distinct dairy breeds upon the milking herds of this country, for the dairy farmer to materially increase our milk, butter and cheese product with a wider margin of profit to the producer, and still reduce the number of milch cows of the country at least 40 per cent.

But I fear too many of us fail to notice the dollar in the distance in our eagerness to procure the penny that drops at our feet and to many, the sum of one hundred dollars or more expended in a good sire seems an extravagant waste, but I will say as I have intimated before, that the approved pure bred sire has been the salvation of all live stock improvement, and though I would sound the warning note against the pedigreed scrub, yet as a means of raising the standard of performance of the dairy cow, I firmly believe it highly essential for our dairymen to keep constantly at the head of their herds, carefully selected pedigreed sires of some of the distinct dairy breeds. Animals selected from a long line of producing ancestry, where dairy function and milk producing ability have become fixed characteristics. By the use of the dairy sire and the selection of the heifer calves from the best producing dams, a marked increase in dairy capacity will be noted, through the prepotency of the sire, as a result of the first cross. The second, third and subsequent crosses tend to intensify the qualities we seek, strengthens the blood lines for dairy utility, and though failures may creep in at times through atavism and reversion, the general tendency will be to lead us gradually up to a higher standard of performance; a standard up and away from the cow of ordinary dairy ability with which we started, and so the question, will we neglect this great proposition of breeding, or will we use a little foresight and learn to know that "like produces like" and that a higher standard of excellence means to us increased profits and less toil?

I believe that size accompanied by a certain degree of refinement is a desirable characteristic of the dairy animal, and also a desirable characteristic of certain families of the different breeds, not because of any additional hardiness in connection with it, but because of the increased capacity of the animal. And again I can conceive of nothing more disastrous than a practice that would tend to undermine the constitutional vigor and stamina of the dairy cow, hence in the matter of feeding, selecting and breeding these become important points and should merit our most careful consideration.

I would recommend the practice of winter dairying. First, for the reason that dairy products command a better price on the market; second, for the reason that farm labor is cheaper during the winter and other farm duties are not so pressing as to divert our attention from many details that conduce to the comfort and well doing of our animals; third, for the reason that I believe it a more favorable time for the early growth of the calf; and fourth, and chiefly for the reason that, by the use of warm comfortable stables, the succulent ensiloed corn crop, good hay and a liberal grain ration, a maximum flow of milk can be maintained for a longer time during the lactation period and at a minimum cost of production.

The gun and the man behind it is the combination that does the most effective execution and there is still needed in American dairy husbandry, more intelligence and a broader dairy education. Our lawyers, our clergymen, our physicians and all our professional men are given years of mental training in our colleges, preparatory to launching into the actual business operations of their chosen professions, but the farmer boy usually finishes his training in the country schools and at an age when he little realizes the importance of mental discipline. But, however, this may be, he receives no special training that touches upon agricultural education. To be sure he knows how to hold a plow, how to drive a team and how to milk a cow, but he knows no more about the composite elements of the soil than he knws about law; no more about a well balanced ration for a dairy cow than he knows about preaching; and no more about the principles of breeding than he knows about medicine, until he is thrown into contact with these propositions in actual business life, where, if he learns at all, he learns by experience, which is often an expensive teacher. And so I say, there is need of a broader education, not necessarily in classical training, but along the lines of our life's occupation.

It has been said: "he who makes two blades of grass grow where but one grew before is a public benefactor", so there can be no question as to the position the live stock husbandman holds in the affairs of American agricultural progress and expansion, but with a broader and more thorough education in special lines of industry and the practical application of such, there are greater prospects in sight, even greater possibilities for him who "follows the path of the cow".

DISCUSSION.

THE CHAIRMAN: Gentlemen we have a few moments which you may devote to asking Mr. Gillette any questions. If anybody in the audience would like to ask Mr. Gillette a question, we would like to have him do so.

MR. WENTWORTH: I would like to ask the gentleman this, what the custom is in Wisconsin of testing. Do the patrons make the tests themselves or do they take their samples and send them to the creamery or cheese factory and have the operator make the test?

MR. GILLETTE: The tests are taken by composite samples from the milk that is delivered to the factory each morning, and those composite samples are tested from once to twice a month at the factory.

MR. WENTWORTH: I meant the individual cow or herd.

MR. GILLETTE: Not often. What we call our official tests in Wisconsin are conducted entirely by representatives of our experiment station and that matter is taken entirely out of the hands of the owner of the animals. Does that answer your question?

MR. WENTWORTH: It does in part, but I do not think you catch my idea. What I wanted to get at was this,—suppose that I am living in Wisconsin, or Iowa for that matter, but under Wisconsin conditions is what I desire to get. I weigh my milk and take a sample. Now would I , or is it the custom there for the farmer to have his individual test and make the test himself, or do you send those samples to the factory and have the buttermaker make the test of the individual cow?

MR. GILLETTE: It is done both ways. I regret to say that like some of you people in Iowa and other states in regard to this great dairy problem of weeding out and selection, that much of this matter is neglected in Wisconsin and in every other state; but our best dairymen weigh their milk usually from every animal in the herd and take composite samples every two or three days in the month, and that composite sample is used as a check on that cow for that month; so with the weights of the milk and per cent of butter fat arrived at in the test, which he saves himself, and I might say that test is sometimes made by the owner of the cow and at the factory, he is able to know at the end of the year just where that cow stands.

Mr. Anderson: What percentage do that?

Mr. Gillette: A very small per cent. As I stated before, if more of them did do it and became acquainted with their own conditions, became acquainted with the cows that were actually robbing them every day, the dairy farmer of Wisconsin, as well as other states in the Union, would be in better condition in a very short time.

Mr. Anderson: Did I understand you to say that if we bought cotton seed meal we received in that $12.30 manure fertilizer per ton?

Mr. Gillette: Yes and no. My comparison would not work out practically, but as compared with the price of comercial fertilizer there is.

Mr. Anderson: Compare it with our farm yard fertilizer. In Iowa we do not buy commercial fertilizer.

Mr. Gillette: Yours is not as old a state, perhaps, as some others and those elements by continual cropping are bound to be worn out in the soil in time.

Mr. Anderson: Have you found out by actual experience that by buying oil meal you get $12.30 value out of it?

Mr. Gillette: Of course I would hate to buy a ton of wheat bran for manuring purposes solely and pay $12.30 a ton for it.

Mr. Anderson: If you buy it for feeding purposes and in addition to the 250 lbs., of protein you get in the ton, do you get $12.30 worth of manure value out of it?

Mr. Gillette: As compared with the price of commercial fertilizers, you do.

Mr. Wentworth: That is if a man had to buy commercial fertilizer. As a matter of fact, we do not buy much commercial fertilizer.

MEMBER: What percent of Wisconsin dairymen use silos?

MR. GILLETTE: The soil is getting in Wisconsin much like the straw stack, it is getting to be a common occurrence and I venture to say it will not be very long before we have silo outfits going through the country filling silos as you have threshing machines going through the corn growing section from farm to farm.

The silo is a thing that has come to stay and I do not see how any dairy farmer can afford to feed cows without the silo. I took a trip last month through the state of Illinois (and I am fearful that the same conditions exist here) and I found corn stover standing upon the grounds of the farms of the state of Illinois. I am confident that you have the same condition of things here; corn stover enough to winter the dairy cows of Wisconsin, Illinois and Iowa combined. Can you afford to make that extravagant waste? If some of our Wisconsin men came down here and through Illinois and saw this wonderful corn stalk crop going to waste every year they would think you ought to be put in the insane asylum, and I am not sure but you had.

PROFESSOR SMITH: Wouldn't it jar your nerves to know that the condensed milk factories of Michigan have sent notice that after this year they are not going to take any milk that is produced by cows giving silage?

MR. GILLETTE: What condensary is that. Is it the Gordon? No others are doing it.

PROF. SMITH: I have been preaching silage for years and this condensary comes along and says "No more milk from silage". We are up against it.

MR. GILLETTE: As I understand it, you have milk condensing plants that have encouraged the building of silos in your section and are today encouraging it.

PROF. SMITH: No sir. Those are the fellows that are condemning it now.

Mr. Morck: In New York state a certain company of Mr. Gordon's says that no silage shall be used for the two million quarts of milk shipped into New York City, so that is even worse than our friend Professor Smith's case.

Mr. Wentworth: We will have to form a silage trust in this state and let them in on the ground floor.

Governor Hoard has been preaching the gospel of dairying for so many years we look upon him as a prophet and example, and over in Iowa I am told that we have not a dairyman in the state but who have been jogging along in the good old fashioned way and laying aside twenty-five or thirty million dollars a year as pin money from the old cow, and the idea I had was that if Governor Hoard got his men to dairying and dairying in the right way, we could go over there and get a lot of inspiration from practical observation.

I like those papers that we get there; I like those rich, juicy editorials in which he tells about alfalfa and every thing of that kind, and I believe in them. I believe Governor Hoard can do these things, I believe that Scandinavian is doing it right along up there, but I want to get a little inside information from Mr. Gillette as to what the average fellow in dairying in Wisconsin is doing, and compare those things with the "slipshod" methods we have been employing over here.

I think in the course of two or three years we will have silos all over Iowa, we are going to be dairyman, and I look for salvation to come right from the efforts of this association and Mr. Shilling in those meetings. I liked the idea that you expressed yesterday, Mr. Chairman, in your address, about getting two or three of the best patrons down here. I liked the idea Mr. Shilling and Mr. Keiffer inaugerated here of getting up creamery associations and picnics. I have been to picnics this summer where there have been as high as four or five thousand people and Mr. Shilling, Mr. Wright or Mr. Keiffer have been there and have talked to those people and you never saw parched corn fields in '94 that absorbed the rainfall the way those people absorbed the talks that were given them. In every community where we have had those meetings, they have built silos and have gone into better dairying. I know men that are trying to test their cows, and buttermakers that have been kind enough to volunteer to test the individual cows. I believe that our buttermakers will go home in the future and will say to their patrons, to the poor and good ones alike, they will not discriminate in that matter, "Bring over your milk and when I have time I will make a test for you. Bring a sample once a week; a composite sample.' I do not care very much for a composite sample particularly; I would rather do it on Sunday, and if the buttermakers could get the farmers to milk their cows on Sunday and take a sample of the morning milk and a sample of the evening milk and have that tested, they could get a fairly accurate test of the quality of their butterfat, and multiplying that by seven you can find out what that cow is doing for seven days, and it will not cost you much of anything.

The scale is the best thing the dairyman ever had next to the pail to put the milk in. We are going to have lots of those things, and they will come along in a general, practical way, as a result of these missionary meetings of buttermakers that have been organized all over Iowa. That is the leaven that has been producing good results. That is the only thing in my mind. I do not go as far as others on this centralizing proposition. I believe there is a great deal of good resulting from the work of the centralizing plants. It is taking the fellow that is so far away that it is impractical to get his milk to the creamery and giving him the opportunity to ship his cream, and I know he sometimes ships under mighty poor conditions. This thing will work itself out in time however, but of course there is the fact that the centralizer is not in touch with the patron and cannot educate that patron as he should, and that patron is not in position to take advantage of the direct tests made by experts, as to what his individual cows are doing, so that patron is going to be an incubus instead of a stimulus to the dairy industry. It is the farmer himself that is going to suffer for it.

THE CHAIRMAN: I am sorry the noon hour has passed and we will have to bring this discussion to a close. Mr. Keiffer has the scores which he will read.

BUTTER SCORE.

SCORE IN DETAIL

F. M. Zeil, of Sumner, won the sweepstakes a solid gold medal, score 97½.

D. W. Mohler, of Ellsworth, won second prize, a silver cup, score 97½.

A. E. Banta, of Wheatland, won third prize, also a silver cup, score 97.

		Flavor.	Body.	Color.	Salt.	Package.	Total.
	Standard	45	25	15	10	5	100
61	W. Ambrose, Tripoli	39½	25	14½	10	5	94
2	Frank Abbott, Mt. Etna	38½	24½	15	10	5	93
145	A. E. Banta, Wheatland	42	25	15	10	5	97
167	T. M. Borglum, Newell	39½	25	15	10	5	94½
91	A. H. Bentz, Delhi	39	25	15	10	5	94
30	C. O. Bomberger, Dunbar	39	25	15	10	5	94
66	W. H. Brownell, Hale	39	25	15	10	5	94
97	C. E. Brant, Fairbank	38½	25	15	10	5	93½
126	C. H. Buehrer, Alta Vista	38½	25	15	10	5	93½
110	C. N. Beach, Alpha	38½	25	15	10	5	93½
86	John Baitinger, Ladora.	38½	25	15	10	5	93½
113	M. E. Benson, La Porte City.	38	25	15	10	5	93
129	Iver Barlow, Calmar	38	25	15	10	5	93
40	B. O. Brownlee, Kanawha	38	25	15	10	5	93
131	J. A. Barker, Luana	38	25	15	10	5	93
206	R. S. Berghsather, Northwood	38	25	15	10	5	93
174	J. J. Brunner, Charles City	37½	25	15	10	5	92½
27	S. O. Batchelder, Martelle	38	24½	15	10	5	92½
96	Geo. W. Baitinger, Victor.	37½	25	15	10	5	92½
122	Roy Burt, Armstrong	37	25	15	10	5	92
219	C. E. Batchelder, Springville	37	25	15	10	5	92
137	W. R. Bullis, Cedar Rapids	36	25	15	10	5	91
197	John M. Beck, Goldfield.	35½	25	15	10	5	90½
220	M. M. Blandin, Orchard	87	25	15	10	5	92
189	C. E. Carr, Frederika	40½	25	15	10	5	95½
117	W. R. Crabb, Greeley	39½	25	15	10	5	94½
99	T. A. Clarke, West Bend	39½	25	15	10	5	94½
6	W. H. Chapman, Waterloo	39	25	15	10	5	94
165	R. W. Chadwick, Waterloo	38½	24½	15	10	5	93
175	O. F. Courbat, New Hartford	38	25	15	10	5	93
26	H. H. Colbert, Menlo	38	25	15	9½	5	92½
62	C. H. Capper, Westgate	38	24½	15	10	5	92½
176	J. W. Cagley, Nashua	36½	25	15	10	5	91½
73	A. Cochrane, Stuart	36	25	15	10	5	91
49	O. A. Day, Summer	39	25	15	10	5	94
87	F. D. Daniels, Fairbank	39	25	15	10	5	94
82	N. O. Dahlen, Tenold	38½	25	15	10	5	93½
34	A. J. Doleschal, Bancroft	38½	25	15	10	5	93½
178	J. F. Dawson, Masonville	38	25	15	10	5	93
1[illegible]	D. L. Driver, Burt	38	25	15	10	5	93
35	E. Den Herder, Sioux Center	36	25	15	10	5	91
195	H. J. Evans, Strawberry Point	41	25	15	10	5	9[illegible]
39	J. G. Ellinger, Aplington	40	25	15	10	5	95
106	L. S. Edwards, Arlington	38½	25	15	10	5	93½
156	Geo. A. Emry, Ryan	39	24	15	10	5	93
144	Harley Evert, Manchester	38½	24½	15	10	5	93
204	R. J. Erb, Arbor Hill.	37	25	15	10	5	92
114	J. H. Eckstein, Ionia.	37	25	15	10	5	92
191	Wm. Evans, Brandon	35	25	15	10	5	90
213	Elder & Elder, Albia	35½	24½	15	10	5	90
218	W. O. Frank, Forest City.	41½	25	15	10	5	96½
186	Farmers Creamery Co., Monticello.	41	25	14½	10	5	95½
162	J. B. Feldman, Dyersville.	39½	25	15	10	5	94½
83	Ben Frank, Titonka	39½	25	15	10	5	94½
3	Jack Frisbie, St. Olaf	38½	25	15	10	5	93½
143	H. E. Forrester, Fredericksburg	38	25	15	10	5	93
192	A. J. Frees, Cedar Falls	38	24½	15	10	5	92½
183	A. H. Ford, Oelwein	37½	25	15	10	5	92½
21	J. W. Fowler, Grinnell	37½	25	15	10	5	92½
15	K. V. Ferris, Church	37	25	15	10	5	92
215	H. E. Ford, Manly.	36	25	15	10	5	91
161	C. R. Fishtemier, Aurora.	37	25	15	9	5	91
79	J. C. Farnham, Rockford	36	25	15	10	5	91

BUTTER SCORE—CONTINUED.

		Flav	Body.	Color.	Salt.	Package.	Total.
	Standard	45	25	15	10	5	100
32	E. A. Gudvangen, Scarville	38	25	15	10	5	93
211	R. L. Griffith, Manchester	38½	24½	15	10	5	93
142	James A. Gordon, Postville	36½	25	15	9½	5	91
64	W. S. Gould, Des Moines	35½	25	15	10	5	90½
94	Geo. M. Griffin, Sigourney	36	25	14½	10	5	90½
123	A. D. Gimer, Cleves	35	25	15	10	5	90
124	E. H. Homan, Waverly	41	25	15	10	5	96
119	A. J. Herman, Maple Leaf	40	25	15	10	5	95
55	Geo. Hanson, Elma	39	25	15	10	5	94
65	H. J. Hankner, Tripoli	49	25	15	10	5	94
147	C. N. Hart, New Providence	39½	25	14½	10	5	94
166	O. S Holaday, Lake View	38	25	15	10	5	93
67	Albert Heyer, Cumberland	37½	25	15	10	5	92½
51	H. C. Hemenway, Waubeek	37½	25	15	10	5	92½
188	J. C. Hall, Creston	38	24½	15	10	5	92½
146	A. E. Hicks, Guernsey	37½	25	15	10	5	92½
212	C. W. Hicks, Guernsey	37½	24½	15	10	5	92
163	J. T. Hanna, Lone Rock	37	25	15	10	5	92
159	Charles Hanbold, Blairstown	36½	25	15	10	5	91½
169	G. H Heffren, Mason City	36½	24½	15	10	5	91
59	F. W. Hessel, Waterville	35	25	15	10	5	90
170	B. C. Iliff, St. Ansgar	37½	24	15	10	5	91½
37	Geo. E. Jensen, Oelwein	38½	25	15	10	5	93½
164	J. R. Jones, Eagle Grove	37½	25	15	10	5	92½
38	M. Jensen, Harlan	36½	25	15	10	5	91½
80	Vic V. Johnson, Burr Oak	35½	24½	15	10	5	90
140	James L. Keachie, Dexter	41	25	15	10	5	96
52	H. C. Koneke, Hudson	40	25	15	10	5	95
22	Sig. Klemesrud, Osage	39½	25	15	10	5	94½
17	Ben H. Kuennen, St. Lucas	39	25	15	10	5	94
160	Soren Kristensen, Scarville	39	25	15	10	5	94
108	N. H. Knudsen, Emmetsburg	38½	25	15	10	5	93½
71	C. T. Knutson, West End	38½	25	15	10	5	93½
200	W. D. Kucker, Fairville	37	25	15	10	5	92
134	G. W. Kelley, Afton	36½	25	15	10	5	91½
9	Wm. Kallenbach, Bremer	36	25	15	10	5	91
201	L. C. Klopp, Bedford	36½	24½	15	10	5	91
193	S. W. Laird, Walker	39½	25	15	10	5	94½
89	T. E. Landis, Farley	39	25	15	10	5	94
109	G. F. Langquist, Saude	39	25	15	10	5	94
7	Loetscher Creamery Company, Loetscher	38½	25	15	10	5	93½
76	F. W. Leinbaugh, Elwood	38½	25	15	10	5	93½
207	Peter Larson, New Hartford	38½	24½	15	10	5	93
210	Fred Lehman, Coggon	37½	25	15	10	5	92½
33	Carl Lissner, Lake City	35	25	15	10	5	90
173	D. W. Mohler, Ellsworth	42½	24¾	15	10	5	97¼
54	C. L. Mills, Sumner	41½	25	15	10	5	96½
29	W. E. Mittlestadt, Iowa Falls	40	25	15	10	5	95
154	E. E. Mittlestadt, Ryan	40	25	15	10	5	95
187	G. O. Miller, Delaware	40	25	15	10	5	95
209	J. J. McAreavy, Coggon	39½	25	15	10	5	94½
25	I. R. Moon, Finchford	38½	25	15	10	5	93½
152	M. J. Mansager, Steamboat Rock	39	24½	15	10	5	93½
77	Frank Mabie, Terril	38	25	15	10	5	93
31	C. C. McCue, Cedar Rapids	38	25	15	10	5	93
171	J. E. McCaffrey, Earlville	38	25	15	10	5	93
4	C. E. McIntire, Adair	37½	25	15	10	5	92½
98	J. O. Miller, Milford	37½	25	15	10	5	92½
118	Harry L. Mickkelson, Lawler	36½	25	15	10	5	91½
104	Wm. Meier, Denver	36	25	15	10	5	91
36	John McLane, Fairfield	36	25	15	10	5	91
184	W P. Muth, Waukon	36½	24½	15	10	5	91
28	J. T. Mogle, Zwingle	35	25	15	10	5	90

BUTTER SCORE—CONTINUED.

		Flavor.	Body.	Color.	Salt.	Package.	Total.
	Standard	45	25	15	10	5	100
70	J. P. Nielson, Brayton	39½	25	15	10	5	94½
107	B. S. Nelson, Swea City	38	25	15	10	5	93
179	Peter Nymann, Harlan	37	25	15	10	5	92
53	F. C. Oltrogge, Tripoli	40	24½	15	10	5	94½
172	F L. O'Dell, Greenfield	39½	25	14½	10	5	94
115	E. B Olds, Sumner	38½	25	15	10	5	93½
69	Gilbert Olson, Kensett	37	25	15	10	5	92
18	A. B. Olson, Langdon	36½	25	15	10	5	91½
8	L. A. Pollard, Sand Spring	40	25	15	10	5	95
19	P N. Peterson, Rake	40	25	15	10	5	95
151	H. W Pettibone, Fenton	39½	25	15	10	5	94½
181	M. J. Powers, Des Moines	36½	25	15	10	5	91½
198	R M. Pressey, McGregor	37	24½	15	10	5	91½
47	J. J. Ross, Iowa Falls	41	25	15	10	5	96
44	A. L. Rosenburg, Grimes	39	25	15	10	5	94
11	James Romine, Urbana	38½	25	15	10	5	93½
100	C. H Rohrssen, Dunkerton	38	25	15	10	5	93
50	J. H, Romine, Viola	38	25	15	10	5	93
1	Frank Riley, Fostoria	37	25	15	10	5	92
130	W. A. Rizer, Monticello	36	25	15	10	5	91
42	B. T. Soles, Fern	40½	25	15	10	5	95½
141	J F. Sharp, Dundee	40	25	15	10	5	95
41	R. J. Savereid, Story City	40	25	15	10	5	95
102	H. C. Sebettler, Baxter	40	25	15	10	5	95
103	John S. Smith, Preston	39½	25	15	10	5	94½
90	F. W. Shellman, Ayrshire	39	25	15	10	5	94
63	F. W. Stephenson, Lamont	39½	25	14½	10	5	94
139	Thomas Sadler, Oelwein	38½	25	15	10	5	93½
68	A. J. Spohn, Miles	38½	25	15	10	5	93½
95	W. L Sloan, Toronto	38	25	15	10	5	93
84	G. E. Stimke, Owatonna, Minn	38½	24½	15	10	5	93
14	Watson Shick, Volga	38	25	15	10	5	93
150	Anton Smith, Luxemburg	38	25	15	10	5	93
168	P. W. Sawyer, Central City	38	25	15	10	5	93
185	P J Saveraid, Huxley	38½	24½	15	10	5	93
72	A. W. Snyder, Dickens	39½	25	13	10	5	92½
128	D E. Sheldon, Waverly	37½	25	15	10	5	92½
12	Jackson Smith, Waukon	37½	25	15	10	5	92½
10	D. A Smith, Elkhart	37½	25	15	10	5	92½
13	Ben W Schulte, Dorchester	37	25	15	10	5	92
5	F J Schroeder, Wadena	37	25	15	10	5	92
132	E. E. Starr, Lake Park	37	24½	15	10	5	91½
24	R. D. Sweet, Plymouth	37	24½	15	10	5	91½
48	G Stuessi, Thorpe	36	25	15	10	5	91
125	W. F. Stewart, Fontanelle	36	25	15	10	5	91
57	C L. Scheiber, Four Corners	36	25	15	10	5	91
157	J. R Stratton. Chelsea	37	24	15	10	5	91
101	State Center Farmers' Cry., State Center	36½	24	15	10	5	90½
136	L. M. Tysven, Owl Lake	38½	25	15	10	5	93½
177	N. H. Trimble, Alden	39	25	15	10	5	94
202	Guy Thomas, Goodell	37	25	15	10	5	92
88	Peter Thuessen, Kimballton	37	25	15	10	4½	91½
85	J. M Taff, Guthrie Center	36	25	15	10	5	91
121	B. W. Umbreit, Clarion	35½	25	15	10	5	90½
92	C. H. Vanderham, Kanawha	38	25	15	10	5	93
138	J. P. Whalen, Elma	41	25	15	10	5	96
135	H G. Webster Cedar Rapids	40½	25	15	10	5	95½
60	Fred Wills, Sumner	40	25	15	10	5	95
81	A. M. Whitney, Whittemore	40	25	15	10	5	95
93	Geo Wick, Roland	39½	25	15	10	5	94½
196	W H. Woodcock, Conroy	39	25	15	10	5	94
56	J. W. Wedemeyer, Denver	39	25	15	10	5	94
17	Theo, Winter, Williamsburg	39	25	15	10	5	94

BUTTER SCORE—CONTINUED.

		Flavor.	Body.	Color.	Salt.	Package.	Total.
	Standard	42	25	15	10	5	100
158	Emil Weiss, Charles City	38½	25	15	10	5	93½
58	John M. Wollert, Scotch Grove	38½	25	15	10	5	93½
203	Wm. Widdell, Dewar	38	25	15	10	5	93
43	Ed Wilson, Primghar	38½	24½	15	10	5	93
46	Chas. L. Woodworth, Waterloo	38	25	15	10	5	93
74	Edgar J. Whipple, Edgewood	37½	25	15	10	5	92½
75	F. A. Wehling, Readlyn	37½	25	15	10	5	92½
111	Darwin Whipple, Littleport	37½	25	15	10	5	92½
155	C. H. Werder, Storm Lake	37	24½	15	10	5	91½
182	St. Elmo, Wright	37	25	15	10	5	92
45	O. P. Yant, Manning	37½	25	15	9½	5	92
23	F. M. Zell, Sumner	42½	25	15	10	5	97½
78	Fred Ziegler, Lawler	36	25	15	10	5	91
149		34	25	15	10	5	89
190		35	23	15	10	5	88
148		32	25	15	10	5	87
214		33	23	15	10	5	86
194		35	24	15	10	5	89
153		33	25	15	10	5	88
127		33	25	15	10	5	88
105		35	24½	15	10	5	89½
133		34½	25	15	10	5	89½
112		33	25	15	10	5	88
199		32	25	15	10	5	87
217		20	23½	15	10	5	73½
208		34	24	15	10	5	88
120		33	25	15	10	5	88
20		33	25	15	10	5	88
205		35	24	15	10	5	89
116		34	25	15	10	5	89
216		36½	23	15	10	5	89½

THE CHAIRMAN: We will now adjourn until 1:30 o'clock this afternoon.

FRIDAY AFTERNOON SESSION.

President S. B. Shilling in the Chair.

Meeting called to order at 2 o'clock by the Chairman. The first number on the afternoon program was a piano recital by Miss Agnes Kouba, excellently rendered.

THE CHAIRMAN: The next will be the report of the committee on resolutions.

Mr. Nietert, chairman of the committee on resolutions, read the following report of that committee.

REPORT OF COMMITTEE ON RESOLUTIONS.

Resolved, That the convention desires to express its hearty appreciation of the efforts of the Commercial Club, the Mower-Harwood Company, and the J. G. Cherry Company, and the citizens of Cedar Rapids, for their liberal assistance in making the 29th annual meeting of the Iowa State Dairy Association such a grand success.

Resolved, That we desire to extend our many thank to the press of this city, who have so kindly and courteously contributed to the success of this meeting.

Resolved, That this association tender its thanks to the Gurler-Barth company for their kindness in furnishing cold storage for the butter exhibited at this convention.

Resolved, That we express our thanks to our old friend and member Hon. H. D. Sherman, of this city, now past eighty years old, who was our first State Dairy Commissioner, one of the principal organizers of this society, and pioneer Iowa Creameryman, for his kind and cheerful presence at this meeting.

Resolved, That we thank the Hon. James Wilson, Secretary of Agriculture, for the able manner in which he is conducting the affairs of the Department of Agriculture at Washington, D. C., and for the energy and great assistance that he has rendered the dairy interests of our nation. Be it further

Resolved, That we hereby tender our thanks to Hon. Ed. H. Webster, Chief of the Dairy Division of the U. S. Department of Agriculture, Washington, D. C., and his able assistants, C. E. Gray and L. R. Rogers, for the practical and valuable experiments which they are conducting at the State Agricultural College at Ames, Iowa, for the use and benefit of all dairymen.

Recognizing the ability of Prof. C. F. Curtiss, Dean of the Iowa State Agricultural College at Ames and the kind and liberal interest he is taking in the dairy interests of the state,

Resolved, That we take this opportunity to return our thanks for his valuable and efficient service. Be it further

Resolved, That we extend our thanks to Prof. G. L. McKay, Professor of Dairying at the State Agricultural College at Ames, for his untiring energy in behalf of the dairy industry of the state and his kind and able assistance in the Twelve Months' Contest.

Resolved, That the members of this association thank the legislature of the State of Iowa for their appropriations for Dairy Building, Dairy Farm, and a Dairy Herd for the Iowa State Agricultural College. We earnestly believe that the experiments with the various breeds to be conducted on the model dairy farm will be of very great practical benefit to the dairy farmers of this state.

Resolved, That we desire to thank Hon. H. R. Wright, State Dairy Commissioner, and his able assistants P. H. Kieffer, W. S. Smarzo and W. E. Smith, for the Twelve Months' Scoring Contest which they have been successfully conducting for raising the standard of Iowa dairy products.

Whereas, An All Wise Providence has removed from our midst our beloved brother, Mr. Jos. Kolarick, and

Whereas, We deplore the great loss of our friend, who has been actively and untiringly engaged in disseminating dairy knowledge to all our people, therefore be it

Resolved, That in the untimely death of Mr. Joseph Kolarick the press and the dairy interests have suffered an irreparable loss, and we hereby extend our heart felt sympathy to his grief stricken family. Be it further

Resolved, That a copy of these resolutions be sent to his bereaved family and the dairy press.

Resolved, That we tender our thanks to Prof. Ernest A. Leo and his able assistants, Agnes Kouba, Nellie Smith Richardson, Marie Jonas, Luther Fuhrmeister and Inez Jackson for the acceptable rendering of choice selections of vocal and instrumental music and readings, all of which were highly entertaining and added much to the pleasure of this meeting.

Resolved, That we desire to commend and endorse the work of the National Dairy Union, an association organized for the sole purpose of suppressing frauds in all dairy products, and the encouragement and promotion of all laws, both federal and state, for the protection of all pure dairy products.

Resolved, That we endorse the plan of holding local dairy meetings, that we commend the efforts of those who have given their services in this direction, and we urge that this plan be more widely extended.

On motion, duly made and seconded, the resolutions were adopted as read.

THE CHAIRMAN: The next number on our program is by Mr. Alson Secor, of Kimballs' Dairy Farmer.

RELATIVE VALUES.

ALSON SECOR, WATERLOO, IOWA.

Mr. Chairman, Ladies and Gentlemen:—I realize this is a bad part of the program as everybody wants to go home; my sympathies, however, are with the fellows that are to follow me so I will cut my remarks in two, and then cut off half of that. We will get busy right away.

I want to see if we can find out the relative values between the cow, the feed and the care, and the man. Which do you think is the most important of those three, the cow, the feed or the man? Will you put it as the artist did in this picture (showing picture) the cow first, feed second and man third? Well, now I had it put that way on purpose, but I do not agree with it. I will tell you why later on.

Now we will begin with the foundation,—the man; next will be the feed and care that he gives the cow, last will come the cow. That may be the reverse of all authority, but I cannot help it. I think I will prove before I am done that the cow is not the basis of the proposition. She is born, comes into your hands and the whole proposition rests with the farmer. If he does not know enough to feed and care for her right, the best cow in creation will not make a success for him, so the basis of all dairy success is the man.

I have here pictures of two cows picked up by a little stock buyer. What will you give for this one, (pointing to the picture)?

Member——Thirty cents.

Mr. Secor: How many will give $5.00 for such a cow as that? How much am I offered for this one? Is there any dairy authority here can tell by the form what this cow is worth? Will no one dare make a bid on that cow by looking at it? Well I want to tell you that this cow (the first picture shown) if you received $15 for taking her home you would be beat. You could not receive $15 and take that cow home and come out even. I want to say that you could pay $45 for that other cow (the second picture shown) and she would pay for herself in one year by the milk and butter you got from her. Can you tell by the wedges, angles and bumps on those two critters what they are worth? Is the relative value apparent by their hides?

What are these worth (showing second series of pictures). What am I offered for this cow (pointing to another), a better looking critter than the other one? Maybe you think she is not worth thirty cents. This is the same cow as you saw before one year after she had been to the college. It cost the college $15 to keep her; I mean they lost $15 on that cow (showing the first cow), and they made $45 on this one (showing the second cow) the same critters as the others one year later. This simply proves my statement that it is not the cow so much as the man back of it. There has been a man back of this breeding and back of the feeding. This cow (the first one) went to college and had all the opportunities, but she lacked one thing, that is breeding. They were both common cows, but the man is responsible for the results in both cases. This cow (the second one shown) went to college good for nothing, would not give $5.00 for her, and yet after she had been in college a year she picked up and became a splendid milker, gave $45 net, $85 worth of butter and skimmed milk, but $45.00 clear.

In order to show you that it is not in the cow, I have taken the statistics of Hoard's Dairyman, taken from all those creamery patrons, investigated and picked out the Jersey critters, that is the Jerseys, thoroughbreds and grades. There is not a herd in that bunch of any other breed except Jerseys. I take these, not as a slam against the Jerseys, but simply because they are known as a better cow, and these investigations prove that some of these herds make a profit and some do not. It is not the cow, it is the man back of it.

Here is a man that had five cows and lost $7.50 on each one; another had six and has a profit of $7.72; here is a profit of $15.17 per cow, here is a loss of $2.59, a loss of $11.65, a loss of $6.05 and a gain of $10.88 and so on. Do not understand that these are positive facts. There is a relative difference between fact and figure, but they are all treated alike; if one is a liar they are all liars, because the same man took them all. In Connecticut there were 21 of these Jersey herds, including 127 cows; 57 per cent of those made a profit, 43 per cent made a loss. In Pennsylvania there were fourteen herds, 112 cows; 57 per cent profit, 43 per cent loss. Vermont had 37 herds; 32 per cent profit, 68 per cent loss, and that is the way it goes from side to side (illustrating on chart). Now you cannot condemn the feed. There is not a man that dares get up here and say it is the fault of the cow in any of these cases; it is simply the fault of the man that gives the feed.

I have heard it said that it is quoted frequently by one of our dairy authorities that no man would go hunting with a bull dog, but I say a good hunter can go out with a bulldog and kill more ducks than I could with the finest hunting dog on earth. It is simply the man, not the dog. It is the man that has the advantage, that gets the gain. I say it is the man back of the cow rather than the cow. It is the man back of the dog, rather than the dog.

The feed comes into play. I will not take time to point this out. Here is the cost of feed of these different cows, per cow, and you can see by this chart where two different men have paid the same amount of cash. One pays $38.50 to keep his cow in feed and lost $4.71 per cow, and the other paid the same amount, $38.50, and made a gain of $7.45, and you might compare other figures where the cost of keeping was exactly the same but the results are altogether different, and you see they have the same amount of blood back of them. They are all Jerseys, but you have not the same man with the same brains. One man may have certain feeds and make a profit, and another man have the same thing but does not know how to combine them and put them into a cow and get the same results. I sometimes think there are people who have no business to have any kind of cow, are not even fit to take care of the scrubs I showed you first. By this chart I showed you that those scrawny, bony, thirty cent cows were just as good in the hands of the farmer that owned them before the college bought them as they were afterwards, but the man did not have the brains to bring it out.

Here is an illustration. If you can see this chart you will see what brains do for dairy farming. Here is a dairy barn (showing picture of barn). There are three boards kicked off by the horses; a great big pond in front, does not look as though it were twenty feet from the barn; here is the bob sleigh standing out where it has been all summer; here is the dump where the stuff is thrown over to the hogs; two buggies standing outside, not a thing taken care of. That was a good barn but the man did not have brains to take care of it. Here is a dairy barn from which milk goes to the city; forty cows are kept in this dairy barn. This is a fright, and that is all there is to say about it; the hole by the water tank, the milk can standing in the mud just where it was left, nothing is taken care of. It is not the fault of the conditions, it is the fault of the man. You cannot blame those conditions. I would not blame a man for buying a farm and be on it for a few months where such conditions prevailed, but if he remains there long and does not better things, then that man is to blame. I had a worse looking shed when I went on the farm; tore it down and built a new one. A man is to blame for the conditions that exist not as he finds them, but if he allows them to exist.

Now if I have anything to say to the buttermakers it is about the same things. We hear a great deal about standardizing of dairy products. Do you know what I believe,—I believe in Standard Oil. There is not a starter that a buttermaker can use that will do him as much good as kerosene oil; it will not put your butter off flavor, it will give it flavor. You burn the midnight kerosene oil and you will get the starter that will bring your premiums up, up, up. You watch those dairy contest reports; some of the boys started down at 91 and have been coming up to 97. How did they get there? By chance? No, they have been burning standard oil. You might think (I do not know whether I ought to say this in this place or not, but you will pardon me if I step on anybody's toes) you might think from some items that a man wins a prize because he uses a certain line of goods. That is not the case, it is because he burns kerosene oil. You might take one of those 98 fellows, and take away from him the regular starter, the regular separator and those other things and get some other kind; it would bother him a few days until he got used to it, but he has brains to adjust himself to conditions and go on just the same. You take some of those fellows that never score over 75 and give them the best apparatus in Iowa and they could not score 97 if their lives depended on it. Now I am through, and I thank you.

DISCUSSION.

THE CHAIRMAN: Would anyone in the audience like to ask Mr.Secor a question?

MR. ANDERSON: I would like to ask the gentleman what he would do with the farmers that are careless. What would be the method of improvements.

MR. SECOR: If we cannot get them to read dairy papers, if they will not read and understand, it would be a blessing to all creamery men all the way through if they were simply blotted out of existence in the dairy business.

MR. ANDERSON: That is true, but how are you going to do it?

MR. SECOR: I do not know; that is the hardest problem the dairy men have to face.

THE CHAIRMAN: Any other questions? If not, we will pass on to the next number on the program. Professor C. Larsen, of Ames, will speak on the effect of pasteurizing cream.

THE EFFECT OF PASTEURIZING CREAM.

PROF. C. LARSON, AMES, IOWA.

Mr. President, Ladies and Gentlemen: Several speakers who have already addressed this convention have alluded directly or indirectly to pasteurization. Those of you who were here the first day of the meeting and heard our honorable and efficient chief of the dairy division, Mr. Webster, speak and heard him say that we knew very little about pasteurization will pardon me if I am rather limited in the discussion of this subject.

It is a matter of fact that we know comparatively little about pasteurization, as yet it is a new subject, you might say. It is a new phase of the dairy industry and it has been in practice here in the United States only a comparatively few years. It is, however, gradually gaining in favor with the dairymen throughout the country. In this country as well as foreign countries it is finding its usefulness in preparing milk for the city trade and it is gradually being introduced into the buttermaking industry. That is to prepare cream from which butter is made.

It is only about fifteen years since pasteurization was introduced in the Danish dairy world by Dr. Storck, who is a well known dairy authority. About the same time he introduced the use of the starter also; both of these things are rapidly coming into use here. Now we are inclined to pattern a little after the Danes in regard to making butter, simply because they have made it a success, and whenever we see any successful man, successful condition, or successful enterprise, it is our duty to look towards them as a model. The Danes have succeeded in capturing the English market for butter and they supply the bulk of the butter that is consumed by the English people at the present time, and every pound of the butter that is manufactured in Denmark and exported is made from pasteurized cream. That in itself, it seems to me, would speak favorably for pasteurization. The people there have enacted a law which compels every creameryman in the country to pasteurize all of his cream before it is made into butter, and also to pasteurize all the skimmed milk before it is returned to the farm. This law was not enacted with any special object in view of improving the quality of the butter, that is from the standpoint of flavor and body of the butter, but they wanted to improve the sanitary condition and that they have accomplished. In that country tuberculosis has been spreading rapidly during the last few years, and the situation became so alarming that it was necessary for the government to do something in order to prevent or retard, at least, the spreading of this dread disease; by enacting this pasteurization law they have in some measure succeeded in preventing the spreading of this disease.

Here in this country, of course, we are not confronted with these conditions and we do not look to pasteurization to give such effects, but we look to other effects from pasteurization rather than that of improving the sanitary condition of our cream, milk and butter. When pasteurization was first brought into the United States several objections were made to it. In the first place it was claimed that as good a quality of butter could not be made from pasteurized cream, they noticed the flavor of the butter was not so pronounced, so high; but take it through the different conditions of the different seasons of the year, a better average quality of butter can be produced from pasteurized cream than from raw cream.

The second objection that was made to pasteurization was that more fat was lost in the buttermilk. While that is true under equal conditions, it is possible to reduce the churning temperature of pasteurized cream to a greater extent than raw cream, and in that way get a complete churning so that no more butter fat, practically speaking, is lost in buttermilk from pasteurized cream than from raw cream.

The third point to which the people objected was that not so much water was incorporated in the butter from pasteurized cream. Of course by some this may be considered favorable, and others unfavorable, depending on whether we look at it from the producer's or consumer's standpoint. But the variation of water content of butter from pasteurized cream and raw cream is so small that practically speaking it has very little bearing in this connection.

As I stated before, there are a few effects of pasteurizing cream which stand out more prominently than any of the others, and one of these is that it imparts a uniformity to the quality of the butter. If there is any defect in the quality of our butter at the present time I believe it is in the lack of uniformity. Now certain creamery operators are able to produce an excellent quality of butter, perhaps, during the spring of the year or some certain time when the conditions are very favorable for getting good quality. Perhaps the next month the conditions will be unfavorable and we will get a poorer quality of butter. When these two qualities of butter, a good and poor butter, are placed on the market, the whole is judged according to the standard of the poorer quality. We are not going to get paid on an average according to the best butter we send, but according to the poorest quality. As a rule, that is true, and the matter of uniformity of butter is one of the principal things to consider. It is on account of the uniformity of the Danish butter that that butter stands so high in the estimation of the English consumers.

This uniformity is brought about first by pasteurization or heating the cream to a high temperature, by taking off the bad gasses or taints which the cream might contain. During the fall of the year when the cows are grazing, say in the late fall when the pastures are short and there are many weeds in the pastures, the cows will feed upon these and, as a result, the milk assumes a bad flavor or gets a bad taste. This flavor can to a large extent be eliminated, I would not say entirely, but to a large extent by pasteurization of the cream.

During the winter when sometimes the milk is permitted to stand in the barn and absorb the barn odors, a great deal of the milk comes to the creamery which has this barn smell. This can also to a large extent be eliminated by pasteurizing the cream.

The second way by which uniformity is brought about by pasteurization is that it enables the buttermaker to control the fermentation of the cream. When we pasteurize a sample of cream the most of the germs are destroyed. All milk and cream contain a large number of germs of different kinds; there are desirable germs, and undesirable germs. When we pasteurize that cream we destroy most of these germs, and when that cream is cooled down again and a good starter is added, or a starter which contains desirable germs, at a favorable temperature, we have favorable conditions for getting uniform results every day.

The second effect of pasteurization is that it improves the keeping quality of the butter, and that improvement in the keeping quality of the butter is quite an important thing at the present time, simply because the storage of butter from the time of large supply and small prices to the time of small supplies and higher prices is becoming a very important thing, and for that reason it is very important for creamery operators to manufacture butter which has good keeping qualities, and it has been amply proven in practical work, as well as through experimental work at our different experiment stations, that butter made from pasteurized cream has much better keeping qualities than has butter made from raw cream. That improved keeping quality is simply due to the fact that when we pasteurize the cream we destroy the germs, desirable and undesirable, most of them; when we have added desirable germs by using a starter, so that when the cream is ripened it contains germs of the deirable kind, and when that cream is made into butter, none but the desirable germs are transferred to the butter, that is providing the butter is not contaminated during the process of manufacture, such as from impure wash water, unclean churns, utensils, etc., but it is taken for granted that any buttermaker who is able and qualified to carry on pasteurization properly knows how to govern those other conditions as to not injure the keeping quality of the butter.

At the Iowa experiment station we carried on experiments to demonstrate this phase of the subject; we found that butter made from pasteurized cream and washed in pasteurized water kept in good condition about seventy days, or ten weeks; butter manufactured from the same quality of cream but raw, kept in good condition only for about five weeks or about half the time. This butter was kept under normal creamery conditions in a refrigerator at a temperature between 60 and 70 degrees F. That illustrates that butter from pasteurized cream will keep much better than butter from raw cream. In fact, I think that is the strongest point in favor of pasteurization.

Third.—I would say that the effects of pasteurization of cream is for the improvement of the sanitary condition of the cream, the buttermilk and also the butter. Now we often hear people say that certain contagious diseases, such as tuberculosis, typhoid fever, diptheria, etc., are transmitted through the medium of these products, viz. milk, buttermilk and cream. Now I am not a pessimist in regard to this question. I believe that such an accusation is made much oftener than there is any reason for but I believe that there is a possibility of transferring these diseases to different people and also to animals, and it is well in this connecion to consider pasteurization as one of the the effects of preventing this You know that Denmark passed their pasteurization law I have referred to, to improve the sanitary condition of the cream, milk and buttermilk and butter.

Now I do not want you to understand me to say that butter will carry these different diseases. Butter is quite as poor a medium as we know of for retaining and carrying these diseases, but the cream or buttermilk might contain germs of these diseases. Of course we all know that a sour substance of any kind, especially of dairy products, is not a favorable substance for those germs to thrive in.

The fourth and last effect of pasteurization of cream is that it tends to improve the creamery operator. Now that may seem a strange statement to make, but it is true nevertheless. If a man is going to make pasteurization a success, he must be well informed; he must know something of the properties of cream, butter and milk and he must know something about the principles upon which a pasteurizer works. In short he must know more than the creamery operator who does not pasteurize his cream. It stands to reason, that if a man understands pasteurization in a creamery he has got to be above his position. We never saw a successful man yet below his profession; a successful man is always above his profession. If it requires greater skill and greater knowledge to make use of pasteurization, then we are not only elevating the business continuously but we are elevating the man as well who is behind the business, and I think we may argue that pasteurization is a good thing from that one standpoint alone.

Now the effects of pasteurizing cream that I have already mentioned apply, of course, to the different qualities of cream, but it is not always that we can get successful results by pasteurizing the different qualities of cream. Centralizing plants are at the present time pasteurizing the cream, whether sour or sweet. It does not matter what condition it is in, it is run through the pasteurizer. There is a certain quality of sour cream which does not pasteurize very well. I have seen cream go through the pasteurizer and in perfectly good condition when it started at one end, and came out at the other just as lumpy and slimy as any cream could be. That is a poor condition to have, when the curd coagulates, it envelopes a good deal of fat; as a consequence we are going to lose a great deal in the buttermilk. I have seen some of that butter milk test as high as .3 per cent fat. This is due to the fact that this thin cream sours, coagulates and holds a lot of the fat in the curd and when we are churning it we do not get the fat out, it stays in the buttermilk. Now there is a tendency, when we pasteurize cream containing less than 28 per cent fat, for the curd to coagulate during the process of pasteurization. Coagulation does not take place when the cream is really sour, to such an extent as cream which was between .3 and .4 per cent acidity. Whenever milk or cream is slightly sour, just so we can taste it, it will curdle or coagulate on heating. When thin cream has this acidity between .3 and .4 per cent it always coagulates and the only way to overcome it is to have the patrons skim a richer cream. I have never seen rich cream that would not pasteurize all right no matter what condition it was in. However, when cream is real bad,—that is gassy cream,—I have seen cream so foamy and gassy as to blow off the cover of the can,—when such cream is pasteurized it will not remain in good condition. It becomes lumpy and in bad shape; but under normal conditions pasteurization of sour cream can be carried on successfully.

At the experiment station at Ames we carried on a large number of experiments a couple of years ago in order to try to remedy cream or neutralize the cream so as to enable us to pasteurize it without having any abnormal effects. We tried to neutralize thin cream that was sour by using lime water; we used baking soda, and powdered chalk and these neutralized the cream and it pasteurized all right, but the trouble was that the butter would not keep. The butter was improved right after churning but usually within twenty-four hours it would assume a bitter and rank flavor. As the results were entirely negative nothing has been given out concerning it.

I noticed in the papers sometime ago, I think it was in Chicago Dairy Produce, that Mr. Fulmer had treated cream with viscogen, which is simply a substance composed of lime water and cane sugar and tends to make cream thick. He added this substance in a small quantity and claims he used it successfully and the cream pasteurized all right. I do not know whether this is a method that ought to be advised, but I hardly think so. I believe that the thing to do is to try to get a good quality of cream. I am not trying to argue for pasteurization as a remedy for poor cream by any means. The best way is to get the farmers to produce a good quality of cream and there will always be plenty of unfavorable conditions so that cream will not come to the creamery in excellent condition.

Now the effects of pasteurization depend not only on the quality of the cream but it may also depend upon the place at which pasteurization is carried on. Pasteurization possibly might be carried on at the farm, it might be carried on at the skimming station, it might be carried on at the central churning plant. Mr. Webster, who worked in conjunction with the Continental Creamery Company, carried on a number of experiments at Colby, Kansas, a few years ago, and they found that after you had to ship the cream a considerable distance, over fifty miles, after it had been pasteurized, that the cream would usually develop sourness during the transportation period. The results they arrived at were that it is best to pasteurize the cream at the central plant rather than pasteurize it at the receiving station, simply because it is often necessary to repasteurize when it arrives at the central plant in case you pasteurize at the receiving station.

I have not said anything in regard to the disadvantages of pasteurization. So far as we know, at the present time, those are, first the initial cost of the pasteurizer, and second the cost of operating, viz. the time and trouble involved. It is generally conceded I think by most people and under most conditions, the advantages outweigh considerably the disadvantages of pasteurizing cream. Of course I am not here to state that it is a paying proposition to invest in the pasteurizing machine under all conditions. At the creamery in which I am interested we have no pasteurizer, and I do not believe it would pay us at the present time to invest, and there may be other creameries in a similar condition; but I think under most conditions it will pay to pasteurize cream. Local conditions, largely will have to govern as to whether it pays for a certain creamery to install a pasteurizer or not. I thank you.

DISCUSSION.

THE CHAIRMAN: We have just a few minutes that we might use in discussing this matter. Are there any questions on the subject?

MR. HUGLAND: I would like to ask Mr. Larsen why pasteurized goods do not bring more than goods from raw material? They certainly should bring more on account of their keeping qualities for export or storage trade.

MR. LARSEN: Yes, I think pasteurized goods really ought to sell at a higher figure than the goods that is manufactured from raw cream. I think they do in England, but it is a defect, perhaps due to the commission men or to the market. I do not know what governs the price of butter, whether it is entirely governed by supply and demand or by the quality. I think there is a tendency at the present time to pay, perhaps, the same price for a poor quality of goods as for the better quality; they do not discriminate sufficiently close and I believe that paying for butter according to quality is one of the things which ought to be encouraged. Mr. Healey, of New York, who is perhaps one of the best authorities we have in the United States in regard to scoring butter and selling butter, states that we ought to have a certain score which is to be paid for at a certain price. That is, supposing the butter scores 93, then there should be paid 25c., for it; for every increase in the score of one point there should be a corresponding increase in the price of one quarter of a cent; if two points above 93 an increase of one half cent. If the score went below 93 or at whatever place the limit was set, then the price would lower one quarter of a cent for every point it went below that score, and so on down. I think that would be a fair scale and think perhaps some similar method will be recognized in the future.

MR. MORCK: I would like to ask Mr. Larsen what would we do with our pure food laws, providing we do use neutralizers in pasteurization? Our laws as they stand prohibit that.

MR. LARSEN: That question came up when we started to carry on this experiment, and Professor McKay wrote to the authorities at Washington, to the revenue department, and several other people who were supposed to be in authority. They replied to go on and experiment with it and they did not think there would be any difficulty, but I am not posted and could not say as to whether the law would prohibit the use of it or not. I think so far there is no occasion to use any neutralizer. I think we ought to apply our energies towards improving the quality of the cream so it will pasteurize properly without the use of neutralizers.

THE CHAIRMAN: Anything further? If not we will take up our program again. We have been particularly favored during this meeting at Cedar Rapids by the entertainment that has been furnished by the city. I do not believe we have ever held a convention where we have had as much really fine entertainment as Cedar Rapids has given us, and not the least of this has been rendered by Miss Inez Jackson, who has favored us before and will appear before you again this afternoon.

Miss Jackson followed with a very enjoyable reading and responded to an encore.

THE CHAIRMAN: The next and last on our program is a paper by Mr. W. B. Johnson, of Arlington, How to Prepare Starters for Cream Ripening.

HOW TO PREPARE STARTERS FOR CREAM RIPENING.

W. B. JOHNSON, MONTICELLO, IA.

Members of the Association, Ladies and Gentlemen: It is with great pleasure that I have been permitted to meet with you at this, the 29th Annual Convention of the Iowa and Dairymen's Association. A meeting where the hearty clasp of the hand of buttermaker, dairymen, supplymen and commissionmen denotes brotherly love and friendship, a meeting of instruction and enjoyment to all and I am glad to be with you.

When Mr. Keiffer, the man whom every buttermaker honors and is delighted to see enter their creamery, providing it is sweet and clean, and they have a fine piece of butter for him to pass judgment upon, asked me to take a place on the program at this meeting, I accepted not because I felt equal to the fulfillment of his invitation but because I could not refuse a man that has always stood ready to lend a helping hand to the cause of dairying or aid a butter maker that was in need. Consequently I promised to do whatever I could.

The subject that he wished me to take up is the preparing and handling of starters for cream ripening. This is a wide subject and one that is in-exhaustable in itself and something that is indispensible in the manufacturing of a fine uniform grade of butter. This has been demonstrated not only by the best buttermakers of this state but by the best buttermakers of the world. Being brought to light in Iowa by such men as Prof. McKay, developed by him and others and pronounced the only way to successful buttermaking, whereby the buttermaker who is furnished good milk or cream can produce butter of a uniform grade. Not wishing to go on record as authority in the starter question but believing that I understand the fundamental principles of starters and knowing that I have accomplished more and derived better results with their use then I could have obtained without I will now give you an idea of how I should handle starters and my experience along the line and their effects upon the finished product. First, how to prepare a starter: The first thing to be done when preparing a starter is to select the best milk that can be found; milk that is clean, milk that is rich in milk sugar, that has a bright appearance, that was produced where the conditions were most favorable. What I mean by favorable conditions is the locality as to drainage, feed, and pure water; where everything is kept clean and sweet, such as cans, pails, strainers, etc., where the barnyard is clean and dry and the stables are kept sweet by an occasional coat of whitewash, and where the man in charge takes pride in his part of the work as milking, with dry hands thoughly aerating the milk after the milking is tion it should be pasteurized in a starter can by heating to 180 to 190 degrees F. holding at this temperature for at least thirty minutes and better yet for one hour, keeping the milk in constant agitation, then cool to 75 or 80 degrees F. then take a quart of this milk put in a glass jar or cooling can that has been properly sterilized, inocculate this with a good commercial culture and place the jar or can in a room that is properly ventilated. Where the temperature can be controlled so that the culture will work, or in other words so that the lactic acid germs will develop by working upon the milk sugar, when coagulation has set in and the milk has an acidity of 38 to 40 degrees (Mann's acid test) it is then ready to propagate as large a quantity of milk as one will need for cream ripening in an ordinary creamery. Then pasteurize the amount of milk desired for your starter to be used in your cream, selecting it the same as for your mother starter, then when cooled to 66 degrees F. inoculate this lot of milk with the small amount which you prepared the day before. Now comes the time to watch and make a study of your starter. By taking several jars and filling them from the large amount of milk which you have just inoculated, handle the jars the same as you did the first jar which you propagated with the culture. Look at these starters and examine them at intervals; taste of them, smell of them, test them for acidity, watch them close; when they begin to coagulate here is the place where a few degrees in acidity will make a wide difference with the finished product, and the most interesting point for close study. Get an idea of what you want and work for it. Get interested in the work and you will like it. Get your head in the game and you will find pleasure in it. Now we will return to the large amount of milk that has been propagated After watching the growth of the lactic acid germ in the small jars, one of which was handled at a low temperature, one at a high temperature, and one at a medium temperature we have decided upon the one ripened at the medium temperature as the best according to taste, smell and appearance so we will handle a large quantity along the same line as we did the small sample which we liked the best. When this large quantity has attained an acidity of from 37 to 40 cc Mann's acid test it should resemble cream as to consistency. It should have a smooth glossy appearance with a mild taste and smell, then we add this to the cream and dilute the cream still more with good fresh milk, stir occasionally and watch and wait for developments, but do not forget to propagate another lot of milk for the next day with some of this lot which you have added to the cream. In this way you can carry a starter along from day to day for ten days or two weeks with safety. I have carried them along for six weeks with good results but it is not advisable unless the maker be a good judge of his starter. Never use all of your old starter until you have a new one made and find it to be good. The new starter may have a bullion flavor but this will pass off after the second propagation. My judgment is that the third or fourth propagation is better than the first propagation. In propagating cream in a whole milk plant, the starter I should use is the one I have just described, the one with a mild lactic flavor. If the cream be of a good quality by using a good starter of about 20 to 30 per cent, then some fresh milk to dilute with, there is no reason why that the finished product should not be fine. What I mean by fine is butter with that creamy flavor, that aroma that floats like zephers in the breeze, you found the same aroma in your starter, the same creamy condition all through the ripening process of the cream. What I am thinking of now is that 98 butter. It is like a magnet it draws a man toward it. It makes him feel like getting on the outside of all of it that he possibly can. This particular flavor can be traced very readily from the butter back to the starter when coagulating, mild, sweet and clean. Now we will take up the starter for hand separator cream. In this case all precaution should be used in preparing the starter the same as in the former case although you are up against a very different proposition. The way the hand separator cream arrives it is necessary that something be done quick or it is of no avail, consequently I use a starter that is high in lactic acid, a starter that will work quick and in a measure choke out, cover up or predominate over a part of the existing evils. The starter used for this kind of cream would be called slightly coarse for the propagation of sweet cream. It has a quick sharp taste instead of that mild pleasant taste. The pasteurizing of hand separator cream aids the starter in the good work and by using precaution getting good cream with the use of a good starter a good commercial package can be turned out, but in some cases, and in some of our centralized plants, it is beyond description the article that is manufactured, the cream that is offered for sale by the producer, the cream that is accepted without a murmur by the manufacturer and the stuff that is made which they call butter. It is simply a fright and in most of these cases you will find no pasteurizer, no starter can, no nothing but natural conditions. How in the name of common sense can we expect the dairy industry to prosper and flourish along the hand separator line until there has been a halt called. Again let me say that without the use of a good starter, properly handled, no matter whether you are working with hand separator cream or whole milk, I believe it is impossible to obtain satisfactory results when a uniform grade of butter is called for and when the trade demands quality. Again the man that uses a starter for contest purposes only is in a hopeless condition. He is uncertain as to what will be the outcome. Boys, you that are not using starters, take my advice and get into the harness, make the starter question a study, watch the developments and do not trust to luck. Get acquainted with the desired bacteria. Do not be afraid of a little extra work. It will pay in the long run and unless you do wake up to the situation and get your head into the game some of these young men that Professor McKay is turning out will take your place and you will be out of a position. Look at the boys who are setting the pace of today. What are they doing? Take a look into their creameries and you will find things in good condition and starters on the way. Again let me impress it upon your minds that it is just as necessary for the buttermaker to become acquainted with the preparing and handling of starters for cream ripening as it is for the housewife to make yeast to start her bread with, and in conclusion let me urge upon you to use judgment, consider well your conditions, do not use forty gallons of starter today and twenty tomorrow unless your conditions demand it, and in your work do not forget the temperature and its effects upon the growth of the bacteria. You must control your conditions and when your conditions change you must change accordingly. Again, I implore you, if you do not already use a starter, to get into line and follow the lactic acid germ to its terminus. Whenever you do this success and glory will be yours and your part will not be found wanting and the dairy industry will profit thereby.

DISCUSSION.

THE CHAIRMAN: Are there any questions that you would like to ask Mr Johnson?

MR. DAY: I would like to ask Mr. Johnson how small a percentage of starter we can use successfully?

MR. JOHNSON: Now I would hate to come out and make a statement on the smallest per cent of starter. I would advise using as large a per cent, or starter as you can possibly. Of course it depends somewhat on the percent of fat you get in your cream. I do not want to dilute my cream to too low a per cent of fat for churning purposes, but I would use all the milk I could get in. Of course a small amount is better than none at all.

MR. DAY: Ten per cent?

MR. JOHNSON: Ten per cent is better than no starter, but twenty percent is better than ten.

THE CHAIRMAN: I do not believe I make any mistake when I say to you that I think we have had one of the best conventions ever held by this association. I believe we have had. I believe it has been the most thoroughly enjoyed, and it is very gratifying to us and I hope to you who have been in attendance, as well as to the officers who have had this meeting in charge.

I did not intend to tell a story, not this kind of a story during the whole meeting, but Mr. Wright told me a story and I feel I ought to tell a story to wind this up. I will tell you a story about an Irishman and a Jew. My saying that I believed the convention had been a good one was what brought it to my mind, and then I remembered Mr. Wright told the story to me.

There was a Irishman and a Jew and a lot of traveling men relating their experiences. At last it difted to theological questions. and at last it got to a point where they were telling one another what they believed about being saved. After they all got around it came the Irishman's turn and he said he did not have much idea about what a man had to do to be saved, or anything about the saving business. but that he had saved a Jew once. The rest wanted to know about it and he said "I will tell you. The Jew and I were out fishing and the Jew got up and wanted to change his seat and fell overboard. We had just been talking about this salvation business and I grabbed him by the hair of the head and said 'Do you believe' and the Jew said he did not, and so he went down; he came up again and I grabbed him again and said 'Do you believe' and he said he did not. Well I let him go down again and as he came up the third time I asked him if he believed and he said he did, and be Jabers I chucked him down under the water and drowned him". I would not have told this if Mr. Wright had not told it to me.

I thank you gentlemen for the kind attention you have given us and you may consider yourselves adjourned for about a year.

MEMBERSHIP.

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Casey, Wm.	Cedar Rapids
Crawford, A. F.	Osage
Cushman, M. A.	Chicago, Ill.
Crause, E. S.	Waterloo
Cherry, W. L.	Cedar Rapids
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Dillon, O. W.	Union
Davis, W. J.	Delaware
Daniels, F. D.	Grove Hill
Dunlap, H. B.	Des Moines
Day, C. A.	Sumner
Daniels, F. D.	Fairbank
Dahlen, N. O.	Tenold
Doleschal, A. J.	Bancroft

Dawson, J. F.	Masonville
Driver, D. L.	Burt
DenHerder, E.	Sioux Center
DuShan, Geo. D.	Osage
Ellis, E. R.	Cedar Rapids
Elvidge, A. O.	Elkader
Elliott, Lewis	West Branch
Elder, C. D.	Manchester
Ericson, Elov	St. Paul, Minn.
Emery, F. L.	What Cheer
Evans, H. J.	Strawberry Pt.
Ellinger, J. G.	Applington
Edwards, L. S.	Arlington
Emry, G. A.	Ryan
Enevoldsen, N. E.	Waterloo
Evert, Harley	Manchester
Erb, R. J.	Arbor Hill
Eckstein, J. H.	Ionia
Evans, Wm.	Brandon
Elder & Elder	Albia
Fortney, H. B.	Ft. Atkinson
Fest, H. L.	Coon Rapids
Fink, Ira	Fairbank
Forster, B. F.	St. Paul, Minn.
Fridly, A. E.	Sumner
Fenning, C. F.	Dyersville
Fox, Frank	Winthrop
Frank, W. C.	Forest City
Ferris, K. V.	Church
Fosse, O. A.	Ridgeway
Fowler, J. W.	Grinnell
Frank, Ben	Titonka
Frisbie, Jack	St. Olaf
Farnham, J. C.	Rockford
Forrester, H. E.	Fredericksburg
Fishtemeir, C. R.	Aurora
Feldmann, J. B.	Dyersville
Ford, H. E.	Manly
Ford, A. H.	Oelwein
Frees, A. J.	Cedar Falls
Farmers Co-op. Creamery Co.	Spirit Lake
Gromman, J. H.	Manchester
Gate, C. M.	Chicago, Ill.
Graham, E. J.	Cedar Falls
Gilbroith, H. R.	Sioux City
Ganson, Chas.	Des Moines
Gray, C. E.	Ames
Graham, F. W.	Omaha
Gillett, W. J.	Rosendale, Wis.

Guthrie, J. C.	Coin
Gordon, James A.	Postville
Griffin, G. M.	Sigourney
Griffith, R. L.	Manchester
Gould, W. S.	Des Moines
Gimmer, A. D.	Cleves
Gudvangen, E. A.	Scarville
Goodridge, De Witt	Goldfield
Gossmer, Wm.	Delmar
Haugland, A. C.	Owatona
Hanson, E. R.	Detroit
Hazelrigg, S. M.	Cedar Rapids
Hutton, I.	Independence
Harris, J. M.	Columbus Jt.
Hilman, Chas.	Cedar Rapids
Hoffman, A. E.	Hampton
Helfter, G. L.	Osage
Hadley, R. R.	Humeston
Howe, C. F.	Omaha
Heuck, C. H.	Davenport
Hyde, Thos.	Humeston
Hoage, K.	Nordres
Hoage, Ole	Ossian
Harding, Chas.	Omaha
Hanson, E. D.	Maquoketa
Huxoll, E.	Clarence
Hohnsbehn, C.	Waverly
Hopkins, H. H.	Dubuque
Henderson, P. G.	Central City
Hershey, M. B.	Norway
Hugh, H. E.	Newton
Hankner, H. J.	Tripoli
Hansen, Geo.	Elma
Hemenway, H. E.	Waubeek
Heyn, Albert	Cumberland
Hicks, O. W.	Guernsey
Hessel, F. W.	Waterville
Haggerty, P. J.	Maquoketa
Hall, J. C.	Preston
Hicks, A. E.	Guernsey
Hart, C. N.	New Providence
Hambold, C.	Blairstown
Hanna, J. T.	Lone Rock
Holladay, O. S.	Lake View
Heffren, G. H.	Mason City
Hermann, A. J.	Maple Leaf
Homann, A. H.	Waverly
Iliff, B. C.	St. Ansgar
Jennings, A. A.	Chicago, Ill.

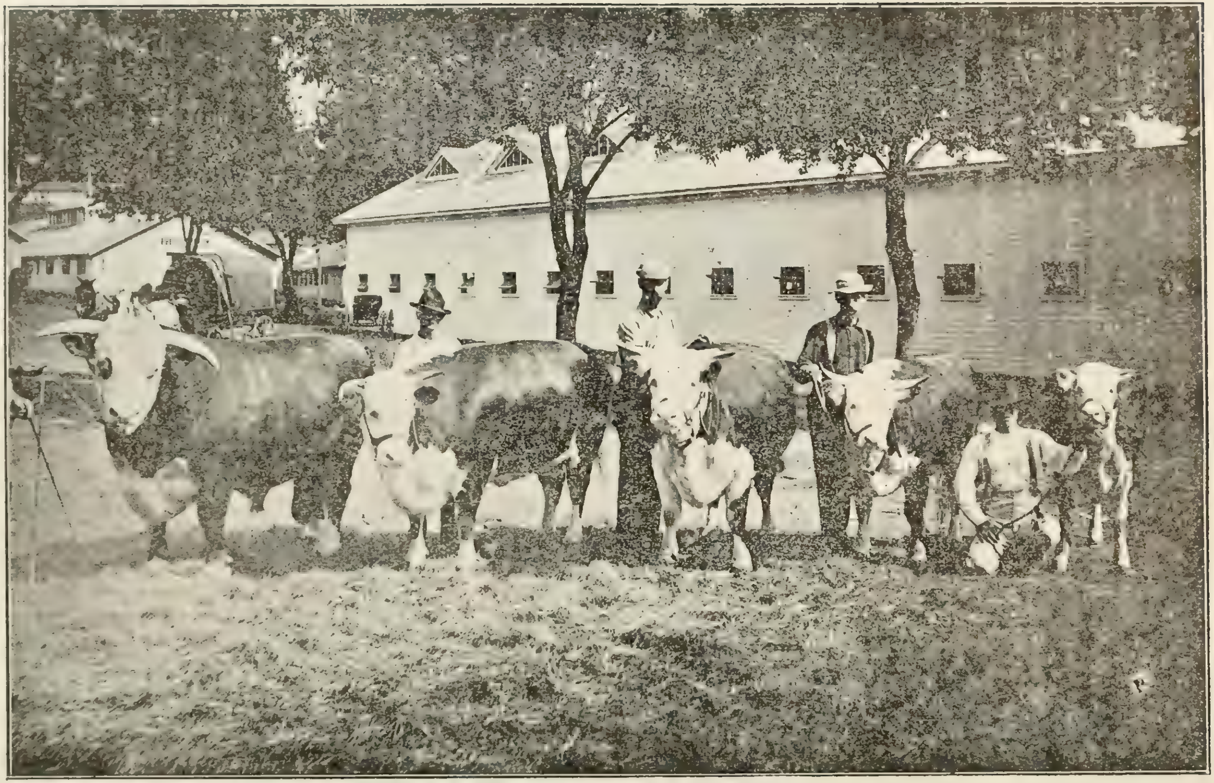
Johnson, W. B.	Monticello
Johnson, J. U.	Ackley
Johnson, W. F.	Lincoln, Neb.
Jones, J. R.	Eagle Grove
Jensen, M.	Harlan
Johnson, V. V.	Burr Oak
Jensen, Geo. E.	Oelwein
Kendall, W. L.	Cedar Rapids
Kieffer, P. H.	Manchester
Kernen, W. P.	Cedar Rapids
Keachie, J. B.	Monticello
Kern, F. B.	Dyersville
Kroeger, W. H.	Benett
Kroeger, W. J.	Preston
Knight, Chas. Y.	Chicago, Ill.
Kelly, G. W.	Wilton
Klopp, L. C.	Bedford
Kucker, W. D.	Fairville
Kristensen, Soren	Scarville
Knutson, C. T.	West Bend
Klemesrud, Sig	Osage
Kelly, G. W.	Afton
Knudson, N. H.	Emmetsburg
Kallenbach, Wm.	Bremer
Kuennen, Ben H.	St. Lucas
Koeneke, H. C.	Hudson
Keachie, James L.	Dexter
Kleckner, F. L.	Monticello
Larson, J. P.	Cedar Rapids
Lundeborg, John	Jewell Junction
Logan, W. S.	Chicago
Larson, C.	Ames
Leighton, F. A.	Des Moines
Landerman, F. A.	Waukon
Ladd, T. G.	Zwingle
Logan, V. A.	Sioux City
Lund, Herbert	Ames
Larson, J. E.	Sioux City
LeBord, Frank	Owatonna, Minn.
Laird, S. W.	Walker
Landis, T. E.	Farley
Langquist, G. F.	Saude
Loetscher Creamery Co.	Waupeton
Leinbaugh, F. W.	Elwood
Larson, Peter	New Hartford
Lehman, Fred	Coggon
Lissner, Carl	Lake City
Lambly, T. E.	New York
McKay, G. L.	Ames

Mechra, E. P.	Chicago
Mack, W. F.	Waterloo
Miller, F. H.	Chicago
Mitchell, Irv	Vinton
Moak, C. B.	Minneapolis
Monroe, W. H.	Sioux Falls
Marriott, J. H.	Long Grove
Mittlestadt, E. E.	Ryan
Mestlebust, J. P.	Fort Dodge
Moeller, C.	Waverly
McNally, R. N.	Hudson
Montgomery, E. E.	Williamsburg
Miner, F. L.	Bloomfield, N. Y.
Moore, W. S.	Chicago
Meinhardt, F.	Chicago
Meiser, Frank,	Ames
Mohler, D. W.	Ellsworth
Mills, C. L.	Sumner
Mittlestadt, W. E.	Iowa Falls
Miller, G. O.	Delaware
McAreavy, J. J.	Coggon
Moon, I. R.	Finchford
Mansager, M. J.	Steamboat Rock
Mabie, Frank	Terril
McCue, C. C.	Cedar Rapids
McCaffrey, J. E.	Earlville
McIntire, C. E.	Adair
Miller, J. O.	Milford
Mckkleson, H. L.	Lawler
Meier, Wm.	Denver
McLane, John,	Fairfield
Muth, W. P.	Waukon
Mogle, J. T.	Zwingle
McCartney, A.	Leon
Morrell, John & Co.	Ottumwa
Nafis, Louis F.	Chicago
Nagle, E. L.	Deep River
Nietert, H. J.	Walker
Nichols, S. B.	Mason City
Nicholson, M. J.	Ossian
Naylor, P. B.	Des Moines
Nielson, J. P.	Brayton
Nelson, B. S.	Swea City
Nymann, P.	Harlan
Nurell, C. A.	Irvington
Oltrogge, F. C.	Tripoli
Odell, F. L.	Greenfield
Olds, E. B.	Sumner
Olson, Gilbert,	Kensett

Olson, A. B.	Langdon
Oskaloosa Creamery Co.	Oskaloosa
O'Neill, D. A.	West Bend
Penn Oil Co.	Cedar Rapids
Palmer, D. A.	Monticello
Pratt, F. G.	Montour
Pennington, C. W.	Sumner
Pollard, L. A.	Sand Spring
Pudrey, C. L.	Nashua
Plumb, H. B.	Waterloo
Peterson, P. N.	Rake
Pettibone, H. W.	Fenton
Powers, M. J.	Des Moines
Pressey, R. M.	McGregor
Parry, C. L.	Anamosa
Peocock, A. H.	Osterdock
Rundall, J. C.	Chicago
Rogers, James	Earlville
Reid, S. B.	Des Moines
Royn, J. B.	Minneapolis
Rundall, W. E.	Cedar Rapids
Reynolds, H. D.	Mason City
Reynolds, Walter	Mason City
Russler, Chris	Hawkeye
Reinsberger, D. R.	Pella
Rockwell, C. R.	Belle Plaine
Ross, C. M.	Oelwein
Robinson, J. E.	Des Moines
Rizer, W. A.	Monticello
Reinberg, G. F.	Lowden
Robertson, A. E.	Center Junction
Rohde, C. J.	Manchester
Rundall, J. E.	Janesville
Ross, J. J.	Iowa Falls
Rosenberg, A. L.	Grimes
Romine, James	Urabana
Rohrssen, C. H.	Dunkerton
Romine, J. H.	Viola
Riley, Frank,	Fostoria
Richards, F. S.	McGregor
Smarzo, W. S.	Manchester
Strother, Edward	Omaha
Smith, J. H.	Cedar Rapids
Seaman, C. H.	New York, N. Y.
Sperry, J. H.	Grundy Center
Selway, J. G.	Waterloo
Stafford, F. O.	Des Moines
Sudendorf, E.	Clinton
Scott, Z. D.	Dubuque

Shilling, S. B.	Mason City
Smith, W. E.	Des Moines
Smith, W. J.	Waterloo
Smith, C. D.	Agricultural College, Mich.
Stensvad, Rud,	Hull
Shoemaker, E. R.	Waterloo
Saddler, E. T.	Waterloo
Sweger, A. W.	
Shoemaker, A. F.	Garnavillo
Spurbeck, W.	Algona
Sandberg, J. O.	Waterloo
Simpson, C. W.	Monticello
Schmitz, Ed	Elgin, Ill.
Soles, B. T.	Fern
Sharpe, J. F.	Dundee
Savereid, R. J.	Story City
Schettler, H. C.	Baxter
Smith, John S.	Preston
Shellman, F. W.	Ayrshire
Stevenson, F. W.	Lamont
Sadler, Thos.	Oelwein
Spohn, A. J.	Miles
Sloan, W. L.	Toronto
Stimke, G. E.	Owatonna, Minn.
Shick, Watson,	Volga
Smith, Anton	Luxemburg
Sawyer, P. W.	Central City
Saveraid, P. J.	Huxley
Snyder, A. W.	Dickens
Sheldon, D. E.	Waverly
Smith, Jackson	Waukon
Smith, D. A.	Elkport
Schulte, Ben W.	Dorchester
Schroeder, F. J.	Wadena
Star, E. E.	Lake Park
Sweet, R. D.	Plymouth
Stuessi, G.	Thorpe
Stewart, W. F.	Fontannelle
Sceiber, C. L.	Four Corners
Stratton, J. R.	Chelsea
State Center Farmers' Cry.	State Center
Strong, F. W.	Stanley
Stanhope, J. T.	Sioux City
Simmons, R. S.	Cedar Rapids
Tabor, W. C.	New York, N. Y.
Timmerman, Evert	
Tollefson, S.	Burr Oak
Thompson, H. L.	Ft. Dodge
Thompson, W. H.	Lisbon
Tysver, L. M.	Owl Lake

Umbreit, B. W.	Clarion
Vanderham, C. H.	Kanawha
Van Auken, E.	Charles City
Vitton, C. A.	Reinbeck
Webster, E. H.	Washington, D. C.
Woodring, I.	Waterloo
Walker, C. R.	Waterloo
Williams, W. S.	Cedar Rapids
Willis, F. L.	Steamboat Rock
Wright, H. R.	Des Moines
Wentworth, E. M.	State Center
Welch, R. R.	Reinbeck
Whitcomb, C. L.	Fredericksburg
Whittemore, E. J.	Owatonna, Minn
Wehling, John,	Oelwein
Wheelock, J. G.	Maquoketa
Wescott, N. E.	Des Moines
Wollert, J. M.	Scotch Grove
Welzel, F. H.	Postville
Wood, A.	Guthrie Center
Wendt, H. D.	Davenport
Wood, H. S.	Wyoming
Whalen, J. P.	Elma
Webster, H. G.	Cedar Rapids
Wills, Fred	Sumner
Whitney, A. M.	Whittemore
Wick, Geo.	Roland
Woodcock, W. H.	Conroy
Wedemeyer, J. W.	Denver
Winter, Theo.	Williamsburg
Weiss, Emil	Charles City
Widdell, Wm.	Dewar
Wilson, Ed	Primghar
Woodworth, Charles L.	Waterloo
Whipple, Edgar J.	Edgwood
Wehling, F. H.	Readlyn
Whipple, Darwin	Littleport
Werner, C. H.	Storm Lake
Wright, St. Elmo	Central City
Yant, O. P.	Manning
Zell, F. M.	Sumner
Zubrod, J. M.	Boyd
Ziegler, Fred	Lawler



‘GRAND BEEF HERD’’—IOWA STATE FAIR, 1905.
Herefords, Owned by Cargill and McMillan, La Crosse, Wis.

PART VI

EXTRACTS FROM

STATE DAIRY COMMISSIONERS REPORT OF 1905.

H. R. WRIGHT, COMMISSIONER.

CONDITIONS OF THE DAIRY INDUSTRY.

This report shows a larger amount of creamery butter made in the State than ever before reported for any year since such reports have been made. Over 82,000,000 pounds of creamery made butter are shown to have been manufactured in this State for the year ending July 1, 1905, and the make of butter since that period has been phenomenal in amount. Not only is the amount of butter very high, but the price obtained for it is higher than the average price for any year since 1893. At the average price for the twelve months ending July 1, 1905, the New York value of the creamery butter made in this state was in excess of $20,000,000, nearly $5,000,000 more than the value for the next preceding twelve months.

Since 1900, the number of creameries in this State has been steadily decreasing, so that now we have 655 creameries and skim stations, whereas in 1900 the list showed 994. It must be understood, however, that there has not at any time been any corresponding decrease in the dairy business of the State, or the amount or value of the butter made. There have been, before this year, considerable decreases in the amount of butter made, but the causes of the decrease have been easily pointed out. A critical comparison of the amounts of butter made in the different counties and different parts of the State, will show that there has been a considerable increase in the last year in the northern and northeastern part of the state—usually designated the dairy districts; but the largest amount of increase of creamery made butter has been in the southern half of the State. This part of the State, with the exception of a few counties, has never been known as a dairy section at all, and until the introduction of the hand separator and the practice of shipping cream to large central churning stations, the dairy business of the southern half of the State was very small. It never amounted to enough in a locality, so that creamery building was successful, except, of course, in a few instances; but the establishment of the central plants and the shipping of cream by rail made possible the practice of the dairy business by an individual without any particular co-operation on the part of his neighbors. For this reason, there are dozens of localities south of the center of the State where the dairy business has trebled and quadrupled in the last eighteen months, to the very great advantage of the farmers in those counties. Without the centralizing plants and the railway facilities for cream shipping, this dairy business would not exist at all for the reason that the profits in farm-made butter are very small indeed, as compared with those of creamery-made butter. Twenty of these larger plants make a total of 17,627,000 pounds of butter,—twenty per cent of the total for the State. There can be no doubt that the principle of centralization of the creamery industry has been of very great value to the farmers of the southern and western parts of the State, where previously no creamery facilities were within their reach; and equally without doubt, the buttermaking industry of those parts of the State will, for a considerable time, at any rate, be controlled by the central plants; and, except in a few localities where the successful local creameries are now operated, the farmer will be compelled to choose between giving up the practice of dairying altogether and the shipping of his cream to the best market for butter fat within his reach.

It does not follow, however, that the centralization plan is the best either for the farmer or the industry as a whole. It is now, as suggested, the only plan available in many localities, and is very valuable for that reason. But there are plenty of places in the State where successful creameries of another kind are already established, and where also the central creameries have their purchasing agents for cream. There are several facts which ought to be recognized in regard to the centralization of cream for butter making. One of them is the question of expense of the plan. Under the head of "Iowa Manufactures, Dairy Products Second," following, some figures bearing on this subject are given and will repay some study. Under the almost universal practice now, the cream shipping creamery pays its local agent one cent a pound for butter fat purchased and the freight on the butter fat is about one cent a pound for butter fat in addition. So that the farmer has to pay about two cents a pound to get his butter fat to the creamery after he has taken it to the shipping station. That is to say the larger plant is handicapped at the start by two cents of expense more than attaches to the creamery that receives its cream direct from the wagon of the patron.

The cream shipping has another failing necessarily unavoidable, in that in many cases the cream purchased is a long time on the road, in hot weather, amid not too good surroundings, after having been purchased, tested and shipped by an agent, who, in the very great majortiy of cases, has had little or no experience in handling cream. This inevitably results in lowering the value of the cream for butter making purposes, and makes it impossible for even the best of buttermakers to make out of it butter that will bring the highest price, a loss which is, of course, visited upon the producer of the cream.

That the centralization plan is increasingly expensive, is shown by the fact that the net prices paid by them to the farmers at present is less than it was a year ago. At that time this office secured from the central plants themselves statements of the prices they had paid for butter fat for the first ten months of 1904. A comparison with New York prices for butter showed that their net prices for delivery to the creamery was from one-half to one and a quarter cents under New York prices. In order to compare with the present system, it is necessary to remember that for the first ten months of 1904 the centralizer operated upon the plan of buying cream from the individual shipper and that the shipper paid the freight directly, so that his net return was from one and a half to two and a quarter cents under New York. During the past summer, under the agency system, ruling prices have been always two cents under New York, nearly always three cents under New York, and sometimes four cents under the market. Of course, a general statement of this kind does not include the prices that have been paid by certain centralizing plants in localities where competition required a very high price in order to get any business, because in some cases prices above New York have been paid for butter fat and the accusation has been freely made that this was for the purpose, and with the effect of closing up the local creamery.

For a good many years the dairy commissioner and the professors of dairying at the college and a very large number of other persons interested in making the most out of the dairy business of the State have used every effort to induce farmers to take better care of their milk and cream to the end that butter might be made to be sold for a higher price. Progress in the proper direction has always been entirely too slow to satisfy the dairy enthusiast. With the advent of the hand separator, it was discovered that the quality of cream delivered was much below the quality of milk delivered, and that the quality of butter made was actually deteriorating, and with the beginning of the cream shipping system the quality of cream has still further deteriorated, for the reason, as already pointed out, that the cream does not reach the buttermaker as soon as it did under other systems, and hence the greater the deterioration. Competition between the central plants and the local plants has been so strong that in only a few localities is any kind of cream rejected. Hence, the farmer, instead of having an inducement for producing high-class cream, is actually encouraged by the situation to careless practices in the handling of his product. It is not practicable for the local creamery to reject his cream, because then he can ship it to the central plants. Up to the present, the cream has nearly all been paid for at the same price, regardless of its quality of cleanliness or wholesomeness. Practically the only grading of cream, as now practiced, is based on the percentage of butter fat, a less price being paid for low testing cream. If it were practicable for a creamery to receive all cream not unfit for the making of human food, and then make two grades of it, to be kept separate in the creamery and made into two lots of butter and sold and the butter fat paid for at its real value, then the farmer would have no cause to complain at all and would have an inducement of a cent and a half to two cents a pound for producing a better quality of cream. Not only would this be true with the man who now produces second grade stuff, but the same facts would be an inducement to the man who is now producing good cream, because, under the present system, he gets no more for the good cream which he produces at considerable extra expense and labor than does the other man, whose cream is bad.

Experience has shown, however, that such a plan would not probably be followed, except in a few cases. Then there is the further question of what legal enactments and measures would be of value in bringing about the desired result. The statute, at the present, provides a penalty for the sale of unwholesome cream, a statute that was enacted to cover the sale of sweet cream for immediate consumption, and which, of course, would be applicable in cases where unwholesome cream is sold or delivered to a creamery. The enforcement of this statute by the dairy commissioner is not at all practicable on account of the great number of sales of cream to be inspected, and for the further reason that, under the present situation, a partial enforcement, such as could be secured, would only serve as an irritation in view of the fact that so many of the creameries are willing and anxious to accept cream in any condition whatever. If now, an addition to this statute is secured, making it an offense of like character to purchase or receive unwholesome cream for buttermaking purposes, such a statute would not only be practical, but would, to a large extent, enforce itself. The buttermaker, or creamery manager, would not take chances against a law which would cause him to suffer a fine of $25 or $100 and he would make the law an excuse for rejecting the unwholesome cream. Such a law as suggested, followed by any reasonable attempt at enforcement, would very greatly increase the quality of the butter made in the State, would protect the public from being imposed upon by butter made from unwholesome cream, and would add to the profits of the dairy farmers a very considerable amount.

WHAT THE FARMER SHOULD RECEIVE FOR HIS BUTTER FAT.

It is true that creameries vary greatly in size, efficiency of management and quality of butter made, but in the creameries of moderate size, making 160,000 to 175,000 pounds of butter it is easy to make the butter for a cent and a half a pound from the time the milk or cream comes into the factory until the butter goes into the car. If the buttermaker can make a twenty per cent overrun, as he ought to be able to do, then for every pound of butter fat for which he must pay he will have 1.2 pounds of butter which on a 20-cent market will sell for 24 cents, not taking account of the premium. The expense will be

Factory expense	1.5 cents
Freight	1.5 cents
Commission, 5 per cent	1.22 cents
Total	4.22 cents

That is to say if he sells at the market he will lack .22 cents of being able to pay New York prices for butter fat. If he sells at a cent a pound premium he will have .78 cents a pound profits after paying New York price for butter fat. If the market is 25 cents a pound he will sell his 1.2 pounds of butter for 30 cents, and the expense will be the same except for commission which will be 1.5, making the total expense 4.5 cents, so that at this price, without premiums he can pay all expenses of buttermaker's salary, expense of operation, freights and commissions and have money left. And in this day of universal premiums of at least a cent a pound, and prices above 20 cents the year around it is not too much to say that a good creamery should pay New York prices for butter fat—that the farmer is entitled to get, for butter fat delivered at the creamery, at least New York prices. Of course, if the creamery hires the cream collected and hauled to the creamery, or if the cream has to be handled by an agent or transported by freight the cost of such collection must be borne by the farmer. Aside from such expense, if the farmer does not receive New York prices for his butter fat it is because of one of the following reasons:

1. The butter may not be as well sold as it should be. This is the manager's fault and can be easily remedied.
2. The overrun may not be as much as 20 per cent. If not this is the fault of the buttermaker and can be easily remedied.
3. The creamery may be so small that the butter is made at an expense of two or two and a half or three cents a pound. This can only be remedied by increasing the business, and if this is not possible the creamery is thereby handicapped in its competition with the larger creameries of whatever kind.
4. The cream and milk delivered at the creamery may be so poor that the best of buttermakers cannot make high selling butter out of it. This is the fault of the farmer who produces it and the buttermaker or manager who receives it and the loss is almost altogether visited upon the patron. This fault can only be removed by joint action of the buttermaker and the patron.

OVERRUN.

Under present conditions of sharp and varied competition among creameries it is necessary to the successful operation of a creamery to make the most possible butter out of a given quantity of fat—to get the largest possible legitimate overrun.

In the larger creameries a good deal of attention is given to this matter because it is closely connected with the question of profits. In the small creameries comparatively little attention is given to the matter except in a few instances. Our creameries average about 120,000 pounds of butter per year. The usual overrun used to be stated universally as one-sixth or about 16 per cent. When the month's work and payment were figured up and the overrun of butter over butter fat was computed, and deviation from a 16 per cent overrun, whether it was more or less than this amount, was invariably charged to inaccuracy in testing. While the fact was recognized that the amount of water and salt and casein in butter were variable quantities, it was scarcely suspected that skill in butter making could change any of these except, of course, the salt which might be added in almost any amount. The Dairy Department at Ames, by a series of experiments and investigations showed that not only could a skillful buttermaker make his overrun almost anything he desired, but that certain buttermakers in successful creameries were already doing it; that a 16 per cent overrun could easily and legitimately be increased to 20 per cent or even 25 per cent overrun. That is, the skillful buttermaker can make butter having in it only 80 per cent of butter fat just as easily and as certainly as he can make butter containing 86 per cent of butter fat. In the one case he would have a 25 per cent overrun and in the other he would have the usual overrun of about 16 per cent. And the butter containing but 80 per cent of butter fat serves the purpose of the consumer, meets all the requirements of any market for flavor or body or qualities of any kind, violates no law either state or national and traverses no regulations of any kind or character. And yet with all these effects so perfectly understood, so often put in print and so thoroughly discussed, very few buttermakers know what their overrun is except from the books of the creamery at the end of the month, and very few creamery managers seem to care whether their buttermaker makes a proper overrun or not, he gets no more nor no less wages on account of his skill or lack of it in this particular. In a few cases the assistant dairy commissioners have found buttermakers claiming that they were getting habitually 20 or 22 per cent overrun, when tests of their butter showed but 12 or 14 per cent.

The average creamery makes about 120,000 pounds of butter a year, not counting in this the centralizing plants. At the average price for last year this butter sells for nearly $30,000. A difference of only five per cent in the overrun would amount to more than $110 a month for this average creamery, nearly twice the buttermaker's salary. If his butter was so poor in quality as to lose this sum he would be promptly and properly discharged, but there is many a creamery in this state whose income could be easily increased in this particular an amount equal to that here mentioned by a proper increase in the overrun. The larger central plants, with which the smaller plants compete do get this large overrun and competition makes it necessary that the smaller ones who meet this competition shall get as good an overrun as their larger competitors or go out of business because of lack of ability to meet the competition. A differende of only 5 per cent in the overrun makes, at least year's prices a cent and a quarter on the pound of butter fat, a difference of that much in the price the creamery can pay the farmer for his butter fat, three-quarters of a million of dollars for the creamery patrons of the state.

Too many creamery managers and buttermakers rely upon their computations at the end of the testing period in computing the overrun. A much better way is to find the overrun directly from the butter by analysis or other test. In such a method there can be no mistakes arising from improper or careless testing. It is in fact one method of determining whether the testing has been accurate or not. One of the central plants of this state regularly employs a chemist to analyze its butter so that proper steps may be taken to increase or decrease the overrun to the proper and legitimate proportion. Other central plants do something similar, so that they know every day from the butter itself just what its contents are and how much of the whole is butter fat and what percentage of overrun. This department in the report of last year, illustrated and explained apparatus designed in this office for use with the Babcock test, to determine accurately the butter fat content of butter from which the overrun can be computed and the water content may be estimated with considerable accuracy. It is in use in only a few creameries of the State but is quite satisfactory and is the only apparatus in use in our creameries for the purpose. A chemical analysis in the hands of a competent chemist is the only way to get an absolutely accurate estimate of the constituents of a sample of butter, but of course the expense prohibits the smaller creameries from making use of such a system. But approximate results are sufficient in every day work and extremely valuable to the creamery operator.

The question of overrun is of the greatest importance from the standpoint of values and should receive more attention at the hands of the buttermakers and creamery operators.

PREMIUMS ON BUTTER.

During the last ten years there has grown up the practice of paying a creamery more than the published and established official price in all of the markets. A half a cent premium used to be the cause of great pride on the part of the buttermakers whose butter sold for that premium. Now a full cent premium is almost universal, a cent and a half is common, and a cent and three-quarters or even two cents above the market is not by any means unknown. Seconds and firsts sell at the published price of extras and above, and the real extras nearly or quite two cents above the market. Nearly every creamery visited by the assistant dairy commissioners receives a premium, and only those making the very poorest quality confess to receiving less than extra price. So much is this that it is entirely safe to conclude that there is something vitally wrong at the creamery that does not receive a good premium over the market.

On the other hand this practice of premiums makes it possible for swindlers to induce shipments of butter under promise of high premiums. Nearly every year some creamery manager is induced to ship to some unknown firm by reason of excessive premiums offered, and later is compelled to mourn the loss of the butter so shipped. Reliable commission houses easily show their responsibility by their ratings in the commercial agencies or by unquestionable bank references and it is only the incautious manager than can be deceived by the swindler.

THE "WATER SEPARATOR."

One of the causes of thin and poor cream is the so-called water "separator." Those factories that make any distinction between the different lots of cream offered them pay two cents less a pound for butter fat in "hand-skimmed or water separator" cream, for the reason that it is likely to be 24 hours older than hand separator cream, and so of poorer quality; and also is usually of low per cent and hence the freights on it are greater in proportion to its value in butter fat. Not only does the farmer get less price for his cream raised by the "water" method but he loses very much butter fat in the skimmed milk left by the method. If his water "separator" is of the dilution kind he also spoils his skimmed milk for feeding purposes by diluting it more than 50 per cent.

No deep setting system has yet been devised that is superior in results, either in quality of cream produced or closeness of skimming to the well-known submerged cans of the Cooley system. The Cooley system went out of date twenty years ago because the power separator at the creamery would get out of the milk enough more butter fat than the Cooley system to pay the charge of ten or twelve cents a hundred pounds for hauling the milk and show a profit besides. Yet in the last two years hundreds of farmers have bought water "separators," inferior to the kinds discarded a score of years since.

The water dilution system is a kind of perennial humbug inflicted periodically upon the agricultural public for the exclusive and personal benefits of their makers and salesmen. The Iowa Dairy Commissioner's Report of 1899 denounces the dilution "separator" as a humbug and quotes from agricultural experiment stations as far back as 1890 to substantiate the statements made. The use of this system is wasteful in the extreme.

The farmer who will partition off one end of his stock tank, put a cover over it to exclude sun and dust, and arrange so that the water from his windmill runs through this part of the tank, has an ideal place to set his milk for hand skimming or to keep his milk or cream for delivery to the creamery. If he skims his milk by this plan he must be content to lose from one-sixth to one-fifth of the butter fat and to take a low price for the butter fat he sells.

AVERAGE WAGES OF BUTTER MAKERS.

Reports of monthly wages paid 468 buttermakers of the State show an average of $62 per month. Wages run as high as $150 per month. Very few creameries now operate less than full time and no doubt the average amount received yearly by the buttermakers of the state is fully $725 to $750, a total for the State of $400,000.

CHEESE FACTORIES AND THEIR PRODUCT.

The cheese factories of the State now number twenty-nine and reports have been received from twenty-five of these. Only five of these make as much as 100,000 pounds of cheese, and but one makes as much as 200,000 pounds. The total amount of cheese made is 1,575,646 pounds and practically all of it is sold and consumed in the State. It is an anomalous situation that the greatest dairy state in the west must import all but a small part of the cheese consumed, but the fact remains that the farmers of this State have never taken kindly to the cheese making and cheese factories are only possible under exceptionably favorable conditions.

QUALITY OF CREAM AND BUTTER.

The quality of milk and cream and its relation to the quality of butter to be made from the same and the price to be obtained for the finished product are of such obvious relation and importance that continual efforts are made to improve the quality, not only by adoption of better methods of manufacture, but by improving the quality of the material from which the butter is to be made. Three-fifths of the butter made in our creameries is made from cream skimmed on the farm. Since the adoption of the hand separator the quality of cream delivered at the creameries has very materially lowered. At the suggestion of numerous creamery operators the dairy commissioner early in the year sent out a card, of which a copy follows, with a suggestion that the same be reprinted for distribution among the patrons, a suggestion that was followed by a large number of creameries.

GOOD BUTTER

CAN BE MADE ONLY FROM CLEAN, SWEET CREAM.

The following suggestions are made in the hope that they will assist in securing better grades of cream from creamery patrons and so reduce present losses to the farmer resulting from low quality cream and butter:

The farm separator must be washed after each time it is used.

Wash the separator and other dairy utensils with a BRUSH and plenty of washing powder. Rinse with hot water. Don't use a cloth.

Skim a cream of 30 to 35 per cent test.

Immediately after separation cool the cream to the lowest possible temperature, 50 degrees or lower.

Never mix warm cream with cold cream Before mixing, cool the freshly separated cream to the same temperature as that of the cream to which it is added.

Always keep cream cans in cold water, summer and winter.

Don't cover the cans till the cream is cooled. Then keep them closed.

Don't allow cream to freeze It lessens its value and may interfere with accurate testing.

Deliver cream as often as possible, daily in summer and every other day in winter.

Persuade your creamery to adopt and *enforce* rules for the handling of cream.

SHOWING AVERAGE MONTHLY PRICE OF FANCY WESTERN CREAMERY BUTTER IN NEW YORK MARKET.

Month	Twelve months ending Nov. 1, 1896.	Twelve months ending Nov. 1, 1897.	Twelve months ending Nov. 1, 1898.	Twelve months ending Nov. 1, 1899.	Twelve months ending Nov. 1, 1900.	Twelve months ending Nov. 1, 1901.	Twelve months ending Nov. 1, 1902.	Twelve months ending Nov. 1, 1903.	Twelve months ending Nov. 1, 1904.	Twelve months ending Nov. 1, 1905.
November	$ .2330	$ .2112	$ .2325	$ .2337	$ .2600	$ .2487	$ .2412	$ .2650	$ 2317	$.2481
December	.2500	.2250	.2290	.2160	.2720	.2540	.2510	.2920	.2423	.2688
January	.2266	.1900	.2040	.1975	.2650	.2262	.2425	.2762	.2270	.2910
February	.2000	2050	2042	.2100	.2500	.2250	.2862	.2600	.2517	.3218
March	.2185	1900	.1937	.2075	.2550	.2212	.2840	.2860	.2452	.2807
April	1650	.1880	.1980	.1962	.1960	.2099	.2825	.2725	.2284	.3008
May	.1572	.1530	.1580	.1790	.2012	.1900	.2275	.2200	.2012	.2371
June	.1550	1500	1687	.1881	.1950	.1925	.2195	.2160	.1803	2049
July	.1505	.1500	.1687	.1835	.1960	.1960	2131	2012	.1767	.2056
August	.1571	.1675	1860	.2000	2100	.2050	.1990	.1940	.1793	2111
September	.1600	.1930	.2025	.2262	.2150	.2110	2170	.2075	.1947	.2068
October	.1850	2290	2235	.2400	.2190	2200	2362	.2100	.2095	2184
Average val per lb. for each year.	$ .1882	$ .1885	$ .1971	$ .2065	$ .2278	$ .2165	$ 2416	$ .2417	$ 2140	$.2487

On account of "premiums" now almost universally received by the makers of firsts and extras, amounting to from one-half a cent to two cents more than the published market prices, the real price received by the creameries is probably a full cent a pound more than the above averages computed from the official daily prices of butter for the last twelve months.

BUTTER PRODUCTION OF THE STATE FOR SIX YEARS.

	1900	1901.	1902.	1903.	1904	1905
Average pounds of butter per creamery	104,918	105,491	104,152	97.770	* 112,084	o118,000
Total pounds of butter for all creameries	84,965,062	82,706,944	77,885,696	64.565,970	70,000,000	827,07 .88

*In 1904 figures for average the amount made in nine centralizing creameries is not included, but the aggregate is included in the total.

oIn 1905 figures for average the amount of butter made in 20 centralizing plants is not included but the aggregate is included in the total.

CREAMERY BUTTER MANUFACTURED, ETC.

The table herewith shows that from 736,373,890 pounds of milk and 141,369,998 pounds of cream, 75,345,028 pounds of butter have been made. It takes approximately 23 pounds of milk, or a little more than 3 pounds of cream to make a pound of butter. On this basis the pounds of milk given would make approximately 30,000,000 pounds of butter and the pounds of cream given would make 45,000,000 pounds of butter. From these figures, it is seen that three-fifths of the butter of the State is made from gathered cream, largely, of course, hand separator cream.

TABLE NO. 4.

TABLE SHOWING NUMBER OF POUNDS OF MILK RECEIVED, NUMBER OF POUNDS OF CREAM RECEIVED, POUNDS OF BUTTER MADE, POUNDS SOLD TO PATRONS IN IOWA AND SHIPPED OUTSIDE THE STATE, SO FAR AS REPORTED BY THE CREAMERIES.

Counties.	Number Reporting	Pounds of milk received.	Pounds of cream received.	Pounds of Butter Made, and Market for the Same			
				Pounds of butter made.	Pounds sold to patrons.	Pounds sold in Iowa.	Pounds shipped out of the state.
THE STATE	506	736.373,890	141,369.998	75,345.028	3,292.422	3,239,609	68,812.997
Adair	5	4.374.000	1.450,000	678.835	21,858	11.432	645,545
Adams	2	1,720,000	137.803	105,881	1.910	9,750	94.221
Allamakee	7	1,929,000	4,453,520	1,361,102	19,268	36,415	1,305,419
Appanoose	----	----------	----------	----------	----------	----------	----------
Audubon	8	17,468,251	1,298,671	1,291,211	81,834	8,040	1,201,337
Benton	3	----------	1,242,000	342,000	4.400	----------	337,600
Black Hawk	15	31,066.401	3,080.280	2,227,483	153,949	311,786	1,761,768
Boone	2	3.934.214	19.677	180.086	10.172	11.300	158.614
Bremer	21	55,858,344	----------	2,399,736	204.974	124.419	2.070.343
Buchanan	8	32,366.131	519,869	1.619.467	156.224	26,209	1,437,034
Buena Vista	5	1,852,911	1,854 221	697.900	23.342	7,711	666 847
Butler	17	39,873.101	651,000	1,893,579	152.294	58,489	1,682.796
Calhoun	4	1,607,963	1,922.554	728,044	4,542	12.501	711.001
Carroll	7	4.823.587	3,309,746	1,325.801	9.905	2,276	1,313.620
Cass	2	893,025	305.621	136.956	378	6.957	129.621
Cedar	4	1,869,000	544.500	215 410	5,933	43,477	166,000
Cerro Gordo	4	1.000,000	2,637,600	855.200	29,600	13,750	811,850
Cherokee	3	780,000	474.300	193,400	1,300	900	171,400
Chickasaw	15	32,762,800	4,366.910	2,596,190	158.751	44,335	2,393,104
Clarke	----	----------	----------	----------	----------	----------	----------
Clay	6	7,743,000	944,400	633,300	39.720	2,904	600.676
Clayton	14	15,627,800	7,488,635	2,698,519	61.760	35.813	2.601,943
Clinton	7	7,593.500	153,040	353,550	10,025	17,657	325,868
Crawford	1	----------	3,000,000	1,000,000	----------	----------	1.000,000
Dallas	4	2,587,537	664,858	349,857	15,155	30,980	303,722
Davis	----	----------	----------	----------	----------	----------	----------
Decatur	----	----------	----------	----------	----------	----------	----------
Delaware	24	55,123,197	2,551,431	3,982,920	262,979	133,581	3,586,360
Des Moines	----	----------	----------	----------	----------	----------	----------
Dickinson	5	2,996,860	663,611	360,290	19,910	9.250	331,130
Dubuque	21	26,558,486	4,577,412	2,328,314	95.451	169,960	2,062,903
Emmet	7	6,139,000	569,055	430,850	31.310	2,000	397,540

TABLE NO. 4—CONTINUED.

Counties.	Number Reporting.	Pounds of milk received.	Pounds of cream received.	Pounds of Butter Made, and Market for Same.			
				Pounds of butter made.	Pounds sold to patrons.	Pounds sold in Iowa.	Pounds shipped out of the State.
Fayette	20	51,954,710	2,077,318	2,855,428	226,755	2,548	2,626,125
Floyd	5		4,104,300	1,083,900	35,635	34,000	1,014,265
Franklin	6	6,888,100	1,173,800	841,250	20,600	21,200	799,450
Fremont							
Greene							
Grundy	6	15,595,600	780,800	929,260	75,920	4,250	849,090
Guthrie	10	11,366,400	1,752,300	1,015,600	30,860	50,580	934,160
Hamilton	4	12,563,000	787,500	727,840	81,100	1,400	645,340
Hancock	7	4,159 000	2,124,600	795,410	20,625	900	773,885
Hardin	10	27,273,873					
Harrison	1	1,028,000	27,200	53,600	2,900	5,100	45,500
Henry							
Howard	8	5,804,660	1,505,244	790,386	42,200	7,138	741,048
Humboldt	10	8,882 800	1,064,400	656,785	41,070	6,500	669,215
Ida	2		585,800	205,000	4,250	6,000	196,750
Iowa	7	12,977,900	260,120	680,180	64,150	122,700	493,330
Jackson	13	12,460,050	2,628,850	1,388,090	27,100	45,600	1,315,390
Jasper	2	2,976,600	169,000	179,315	11,085	1,820	166,410
Jefferson	2	1,382,213	219,300	115,190	4,340	15,000	95,850
Johnson	1		80,000	27,100		20,220	6,880
Jones	13	37,568,249	1,824,332	2,231,160	102,658	94,837	2,033,665
Keokuk							
Kossuth	21	31,235,586	1,961,055	1,868,650	145,343	27,465	1,695,842
Lee							
Linn	13	17,239,490	2,529,475	1,460,813	46,857	178,310	1,235,646
Louisa							
Lucas							
Lyon	2	770,760	803,280	871,970	3,835	1,725	866,410
Madison							
Mahaska	1		380,000	94,000		10,000	84,000
Marion	1		401,000	126,800	5,700	22,500	98,600
Marshall							
Mills							
Mitchell	9	471,700	4,527,020	1,318,045	49,062	217,070	1,051,913
Monona	1		130,540	40,000	400	75	39,525
Monroe	1	1,235,480	109,800	86,140	6,300	16,250	63,590
Montgomery							
Muscatine	1		282,640	62,800	300	36,700	24,800
O'Brien	5	3,294,718	2,342,760	761,882	19,451	11,300	731,131
Osceola	2	630,000	887,150	415,720	4,000		411,720
Page	1		3000,000	1,000,000		100,000	900,000
Palo Alto	14	36,235,643	783,684	1,459,744	158,482	43,185	1,249,067
Plymouth	3	3,485,700	416,240	293,000	16,250	870	275,880
Pocahontas	3	275,000	651,450	235,180	3,360	1,140	230,680
Polk	5	2,854,000	5,866,842	2,067,483	5,225	558,900	1,503,358
Pottawattamie	5	6,466,465	1,880,810	1,277,110	600	26,000	1,250,511
Poweshiek	3	2,566,465	1,064,810	365,610			365,610
Ringgold							
Sac	8	2,769,795	1,766,598	657,663	22,275	670	634,718
Scott	1		160,000	40,500	1,000	12,500	27,000
Shelby	8	4,977,185	1,222,802	650,469	30,735	4,345	615,383
Sioux	6		2,968,230	1,159,299	13,235	1.79	1,144,274
Story	7	13,815,880	684,785	766,010	138,580	30,900	597,330
Tama	4	3,201,615	451,740	277,900	1,140	7,100	269,660
Taylor	2		4,500,000	1,160,670	2,500	7,200	1,150,970

TABLE NO. 4—CONTINUED.

Counties.	Number Reporting.	Pounds of milk received.	Pounds of cream received.	Pounds of Butter Made, and Market for Same.			
				Pounds of butter made.	Pounds sold to patrons.	Pounds sold in Iowa.	Pounds shipped out of the State.
Union	1	----------	2,250,000	750,000	----------	50,000	700,000
Van Buren	----	----------	----------	----------	----------	----------	----------
Wapello	2	760,000	760,900	290,580	3,600	34,950	252,030
Warren	1	6,436,400	1,387,550	693,031	3,000	3,000	687,031
Washington	----	----------	----------	----------	----------	----------	----------
Wayne	----	----------	----------	----------	----------	----------	----------
Webster	2	255.110	969.090	314,280	770	17.390	295.210
Winnebago	9	20,720,295	745,357	1.141,955	90,773	12,979	1,038,273
Winneshiek	13	----------	7,531,772	2,945,697	37,137	15,620	1,992.940
Woodbury	2	----------	13.617,650	4,846,920	1,700	200,000	4,645,220
Worth	8	11,188,340	1,230,390	669,991	97,475	12,070	560,446
Wright	4	----------	1,700.000	522,959	20,145	6,500	496,305
THE STATE	506	736,373.890	141,369.998	75,345,028	3,292.422	3,239.609	68,812.997

COUNTIES SHIPPING MORE THAN 1,000,000 POUNDS, NET, OF BUTTER IN THE YEAR ENDING SEPTEMBER 30, 1905.

1905	Counties,	1
8,073,201	Woodbury	5,578.214
5,827.811	Polk	3,271,425
3.149,783	Clayton	2,593,436
2,795.237	Bremer	2,109.607
2,560,853	Dubuque	2,276,778
2,474,109	Delaware	2,21,238
2,404,323	Lee	2.503,339
2,399,885	Page	6 5,417
2,385,084	Fayette	2,022,812
2,286,316	Jones	2,850,341
2,146,074	Chickasaw	1,822,304
1,954,725	Butler	1,579,732
1,929,405	Kossuth	1,556,977
1,923,942	Carroll	1,272.854
1.919,209	Winneshiek	1,622,369
1,823,524	Buchanan	1,810,479
1,784,288	Mitchell	1,180,633
1,695,842	Linn	1,366,299
1,631,311	Hardin	1,381,490
1,569,576	Sioux	1,003,287
1,543,515	Jackson	1,349,736
1,479,030	Hamilton	1,158,989
1,393,355	Cerro Gordo	820,550
1,338,071	Black Hawk	1,086,418
1,331,358	Adair	647,744
1,327,357	Audubon	590,438
1,301,753	Union	488.402
1,293,597	Allamakee	1,227,289
1,084.465	Palo Alto	1,033,962
1,070,783	Calhoun	1,015,375
1,049.955	Howard	1,007,981
1,008,893	Grundy	619,833
1,005,203	Buena Vista	843.712
1.004,439	Crawford	895.137
9,950,905	Totals	53,573.757

These 34 counties ship 76 per cent. of the 91,051.551 net pounds of butter shipped from the State.

COMMISSIONER'S NOTE—Through the kindness of the freight officials of the various railroads of the state, this office is able to give the above table showing the number of pounds of butter shipped from each county in the state to points outside the state. The railroads report the gross weight, but the table given herewith shows the net weight, which is found by subtracting sixteen per cent of the gross weight.

TABLE SHOWING TOTAL NET BUTTER SHIPMENTS OF THE STATE FOR THE YEARS 1890 TO 1905 INCLUSIVE, FROM IOWA TO POINTS OUTSIDE THE STATE; ALSO INCREASE OR DECREASE AS COMPARED WITH THE YEAR PRECEDING

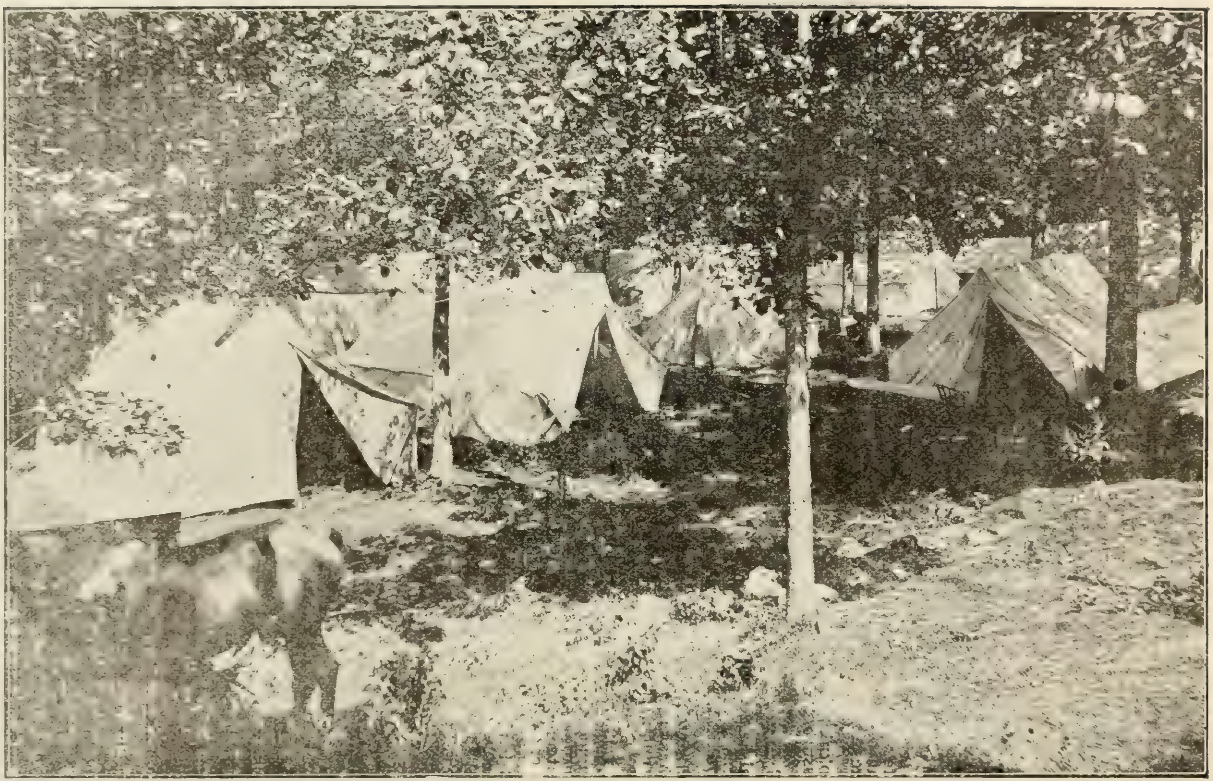
Years Ending October 1.	Net pounds of butter shipped.	Increase over preceding year.	Decrease from preceding year.
1890	71,255,793		
1891	68,690,716		2,565,080
1892	60,112,931		8,577,785
1893	54,572,902		5,540,029
1894	54,509,417		63,485
1895	66,497,108	11,987,691	
1896	80,032,916	13,535,808	
1897	83,620,081	3,587,165	
1898	75,364,337		6,255,744
1899	76,620,326		744,011
1900	71,719,329		4,910,997
1901	74,863,995	3,144,666	
1902	72,714,584		2,149,411
1903	77,079,794	4,365,210	
1904	75,889,260		1,190,534
1905	91,051,551	15,162,291	

TABLE SHOWING NET POUNDS OF BUTTER SHIPPED OUT OF THE STATE, AS REPORTED BY THE RAILROADS.

Counties.	1904	1905	Increase	Decrease
The State	75,889,260	91,051,551	15,162,29	
Adair	647,744	1,331,358	683,614	
Adams	51,920	34,334		17,586
Allamakee	1,227,289	1,293,597	66,308	
Appanoose	59,807	357		59,450
Audubon	899,438	1,327,357	427,919	
Benton	422,953	457,983	35,030	
Black Hawk	1,086,418	1,338,071	251,653	
Boone	67,501	49,073		18,428
Bremer	2,109,607	2,795,237	685,630	
Buchanan	1,810,479	1,823,524	13,045	
Buena Vista	843,712	1,006,203	162,491	
Butler	1,579,732	1,954,725	374,993	
Calhoun	1,015,375	1,070,783	55,408	
Carroll	1,272,834	1,926,902	654,068	
Cass	72,695	201,247	128,552	
Cedar	374,984	264,171		110,813
Cerro Gordo	820,570	1,393,455	572,885	
Cherokee	181,671	270,089	88,418	
Chickasaw	1,922,304	2,146,074	223,770	
Clarke	9,118	20,756	11,638	
Clay	688,174	676,754		11,420
Clayton	2,693,436	3,149,763	456,327	
Clinton	904,853	656,448		248,405
Crawford	895,137	1,004,439	109,302	
Dallas	399,585	561,107	161,522	
Davis	84	1,024	940	
Decatur	98,975	84,048		14,927
Delaware	2,021,238	2,474,109	452,871	
Des Moines	266,716	324,177	57,461	
Dickinson	545,900	483,315		62,585
Dubuque	2,276,778	2,569,853	293,075	
Emmet	453,128	597,037	143,909	
Fayette	2,022,812	2,365,684	342,872	
Floyd	799,322	723,058		76,264
Franklin	451,735	733,309	281,574	
Fremont	152,493			152,493
Greene	157,657	63,571		90'486
Grundy	619,833	1,008,893	389,060	

TABLE SHOWING NET POUNDS OF BUTTER SHIPPED OUT OF THE STATE, AS REPORTED BY THE RAILROADS.

Counties	1904	1905	Increase	Decrease
Guthrie	840,372	97,488	----------	742,884
Hamilton	1,158,909	1,470,030	311,121	----------
Hancock	461,899	772,070	310,171	----------
Hardin	1,381,490	1,631,311	249,821	----------
Harrison	283,599	39,600	----------	243,999
Henry	53,579	13,009	----------	40,570
Howard	1,007,981	1,049,955	41,974	----------
Humboldt	727,719	663,453	----------	64,266
Ida	192,767	213,124	20,357	----------
Iowa	610,641	494,717	----------	115,924
Jackson	1,399,736	1,543,515	143,779	----------
Jasper	231,000	131,523	----------	99,477
Jefferson	98,105	155,454	57,349	----------
Johnson	271,771	37,044	----------	234,727
Jones	2,850,641	2,286,316	----------	564,325
Keokuk	118,508	103,278	----------	15,230
Kossuth	1,556,977	1,929,405	372,428	----------
Lee	2,503,339	2,404,326	----------	99,013
Linn	1,366,299	1,695,892	329,593	----------
Louisa	17,794	17,163	----------	631
Lucas	83,757	101,323	17,566	----------
Lyon	221,808	348,060	126,252	----------
Madison	21,584	3,318	----------	18,266
Mahaska	97,255	79,722	----------	17,533
Marion	85,079	212,720	127,641	----------
Marshall	532,231	465,589	----------	66,642
Mills	3,221	4,801	1,580	----------
Mitchell	1,180,633	1,784,298	603,665	----------
Monona	61,253	45,567	----------	15,686
Monroe	32,634	47,653	15,019	----------
Montgomery	60,674	37,591	----------	23,083
Muscatine	52,914	32,328	----------	20,586
O'Brien	703,269	633,893	----------	69,376
Osceola	399,037	526,754	127,717	----------
Page	605,417	2,399,885	1,794,468	----------
Palo Alto	1,033,902	1,084,465	50,563	----------
Plymouth	489,746	460,097	----------	29,649
Pocahontas	383,729	300,666	----------	83,063
Polk	3,271,425	5,827,811	2,556,386	----------
Pottawattamie	296,811	541,130	244,319	----------
Poweshiek	850,174	357,812	----------	492,362
Ringgold	----------	----------	----------	----------
Sac	588,850	635,397	46,547	----------
Scott	257,412	235,652	----------	21,760
Shelby	431,094	443,672	12,578	----------
Sioux	1,003,287	1,569,576	566,289	----------
Story	894,321	875,894	----------	18,427
Tama	577,121	486,272	----------	90,849
Taylor	823,222	978,588	155,366	----------
Union	488,402	1,301,753	813,351	----------
Van Buren	5,560	46,099	40,539	----------
Wapello	78,918	253,105	274,187	----------
Warren	218	1,108	890	----------
Washington	219,222	86,821	----------	182,401
Wayne	803,990	933,923	129,933	----------
Webster	601,100	592,117	----------	8,983
Winnebago	988,737	969,207	----------	19,530
Winneshiek	1,622,369	1,919,209	296,840	----------
Woodbury	5,378,214	8,073,201	2,694,987	----------
Worth	709,717	792,345	82,628	----------
Wright	863,009	582,230	----------	280,779
The State	75,889,260	91,051,551	15,162,291	----------



Camp Grounds—Iowa State Fair, 1905.

PART VII.

REGARDING THE HORSE.

STALION SERVICE LAW.

OF THE

State of Iowa.

PASSED BY THE

Thirty-first General Assembly.

Becomes Effective July 4, 1906.

AN ACT to repeal sections two thousand three hundred forty-one (2341) and two thousand three hundred forty-two (2342) of the code, relative to the registration and publication of pedigrees, and to enact a substitute therefor.

Be it enacted by the General Assembly of the State of Iowa:

Section 1. Section two thousand three hundred and forty-one (2341) and seciton two thousand three hundred and forty-two (2342) of the code are hereby repealed and the following enacted in lieu thereof.

Section 2. Any owner or keeper of any stallion or bull kept for public service, or any owner or keeper of any stallion kept for sale, exchange or transfer, who represents such animal to be pure bred, thorough bred, standard bred or registered, shall cause the same to be registered in some stud book or herd book recognized by the department of agriculture at Washington, D. C., for the registration of pedigrees, and obtain a certificate of registration of such animal. He shall then forward the same to the secretary of the state board of agriculture of the State of Iowa, whose duty it shall be to examine and pass upon the correctness and genuiness of such certificate filed for enrollment. In making such examination, said secretary shall use as his standard the stud books or herd books recognized by the department of agriculture at Washington, D. C., and shall accept as pure bred, thorough bred, standard bred or registered, any animal registered in any of such stud books or herd books. And if such registration is found to be correct and genuine he shall issue a certificate under the seal of the department of agriculture, which certificate shall set forth the name, sex, age and color of the animal, also the volume and page of the stud book or herd book in which such animal is registered. For each enrollment and certificate he shall receive the sum of one dollar, which shall accompany the certificate of registration when forwarded for enrollment.

Section 3. Any owner or keeper of a stallion or bull for public service who represents or holds such animal out as pure bred, thorough bred, standard bred or registered, shall place a copy of the certificate of the state board of agriculture on the door or stall of the stable where such animal is usually kept, and shall furnish to any patron who shall request it a copy of such certificate.

Section 4. If the owner of any registered animal shall sell, exchange or transfer the same, and the purchaser desires it, he shall transfer in writing the certificate issued by the state board of agriculture to the purchaser of such animal, and upon filing such certificate so assigned and accompanying the same with a fee of fifty cents, the secretary of the state board of agriculture shall issue a new certificate to the then owner of the animal, and all fees provided for by this act shall go into the treasury of the department of agriculture.

Section 5. Any person who shall fraudulently represent any animal, horse, cattle, sheep or swine to be pure bred, thorough bred, standard bred or registered, or any person who shall post or publish or cause to be posted or published any false pedigree or certificate; or shall use any stallion or bull for public service, or sell, exchange or transfer any stallion, representing such animal to be pure bred, thorough bred, standard bred or registered, without first having such animal registered, and obtaining the certificate of the state board of agriculture as hereinbefore provided, or who shall violate any of the provisions of this act, shall be guilty of a misdemeanor, and punished by a fine of not more than one hundred dollars, or imprisoned in the county jail not exceeding thirty days, or by both such fine and imprisonment.

Approved, April 10, A. D. 1906.

STUD BOOKS

Recognized by the

U. S. Department of Agriculture.

HORSES.

American Books of Record.

American Trotter.	American Trotting Register.	American Trotting Register Association, Wm. H. Knight, secretary, 355 Dearborn street, Chicago, Ill.
Belgian Draft.	American Register of Belgian Draft Horses.	American Association of Importers and Breeders of Belgian Draft Horses, J. D. Conner, Jr., secretary, Wabash, Ind.
Cleveland Bay.	American Cleveland Bay Studbook.	Cleveland Bay Society of America, R. P. Stericker, secretary, 80 Chestnut avenue, West Orange, N. J.
Clydesdale ..	American Clydesdale Studbook.	American Clydesdale Association, R. B. Ogilvie, secretary, Union Stock Yards, Chicago, Ill.
French Coach.	French Coach Horse Register.	French Coach Horse Register Company, Charles C. Glenn, secretary, Columbus, Ohio.
French Coach.	French Coach Studbook.	French Coach Horse Society of America, Duncan E. Willett, secretary, 2112 Mich. Avenue, Chicago, Ill.
French Draft.	National Register of French Draft Horses.	National French Draft Horse Association of America, C. E. Stubbs, secretary, Fairfield, Iowa.
German Coach.	German, Hanoverian, and Oldenburg Coach Horse Studbook.	German, Hanoverian, and Oldenburg Coach Horse Association of America, J. Crouch, secretary, Lafayette, Ind.
Hackney.	American Hackney Studbook.	American Hackney Horse Society, A. H. Godfrey, secretary, P. O. Box 111, Madison Square, New York, N. Y.
Morgan	American Morgan Register.	American Morgan Register Association, H. T. Cutts, secretary, Middlebury, Vt.
Oldenburg ..	Oldenburg Coach Horse Register.	Oldenburg Coach Horse Association of America, C. E. Stubbs, secretary, Fairfield, Iowa.
Percheron. ..	Percheron Studbook of America.	Percheron Society of America, Geo. W. Stubblefield, secretary, Union Stock Yards, Chicago, Illinois.
Percheron. ..	Percheron Register......	The Percheron Registry Company, Chas. C. Glenn, secretary, Columbus, Ohio.
Percheron ...	The American Breeders' and Importers' Percheron Register.	The American Breeders' and Importers' Percheron Registry Company, John A. Forney, secretary, Plainfield Ohio.
Saddle Horse.	American Saddle Horse Register.	American Saddle Horse Breeders' Association, I. B. Nall, secretary, Louisville, Ky.
Shetland Pony.	American Shetland Pony Club Studbook.	American Shetland Pony Club, Mortmer Levering, secretary, Lafayette, Ind.
Shire.........	American Shire Horse Studbook.	American Shire Horse Association, Charles Burgess, secretary, Wenona, Ill.
Suffolk.	American Suffolk Horse Studbook.	American Suffolk Horse Association, Alex. Galbraith, secretary, Jamesville, Wis.
Thoroughbred.	American Studbook.	The Jockey Club, James E. Wheeler, registrar, 571 Fifth Avenue, New York, N. Y.

HORSES.

Foreign Books of Record.

Belgian Draft.	Studbook des Chevaux de Trait Belges.	Societe Le Cheval de Trait Belge, Chevalier G. Hynderick, secretary, Brussels, Belgium.
Boulonnaise[2]	Studbook des Chevaux de Trait Francais.	Societe des Agriculturs de France, M. Henri Johanet, secretary, 8 Rue d'Athenes, Paris, France.
Cleveland	Cleveland Bay Studbook.	Cleveland Bay Horse Society of Great Britain and Ireland, Wm. Scarth Dixon, secretary, Saltburn by the Sea, York, England.
Clydesdale.	Clydesdale Studbook	Clydesdale Horse Society of the United Kingdom of Great Britain and Ireland, Arch'd MacNeilage, secretary, 93 Hope street, Glasgow, Scotland.
East Friesland Coach.	Ostfriesisches Stutbuch	Landwirthschaftlichen Hauptverein fur Ostfriesland.
French Coach.	Le Studbook Francais Registre des Chevaux de Demi-Sang.	Commission des Studbook des Chevaux de Demi-Sang, Director-General des Haras, Ministere de l'Agriculture, Paris, France.
French Draft[3]	Studbook des Chevaux de Trait Francais.	Societe des Agriculturs de France, M Henri Johanet, secretary, 8 Rue d'Athenes, Paris, France.
Hackney.	Hackney Studbook	Hackney Horse Society, Frank F. Euren, secretary, 12 Hanover square, London, W., England.
Hanoverian.	Hanoverian Studbook	Hannoversches Stutbuch commission, Frieherr V. Froschke, President, Hannover, Germany.
Holstein Coach.	Gestutbuch der Holsteinischen Marschen.	Verband der Pferdezuchtvereine in den Holsteinischen Marschen. Martin Thormahlen, secretary, Moorhusen per Elmshorn, Holstein, Germany.
Oldenburg Coach.	Oldenburger Stutbuch	Verband der Zuchter des Oldenburger eleganten schweren Kutschpferdes. Justus Schussler, secretary-treasurer, Rodenkirchen, Oldenburg, Germany.
Do	Stutbuch der Musterlandisch-Oldenburgischen Geest.	Zuchtverband des sudlichen Zuchtgebietes.
Percheron	Studbook Percheron de France.	La Societe Hippique Percheronne de France, M. Raoul Boullay, secretary, Nogent-le-Rotrou, France.
Shire.	Shire Horse Studbook.	Shire Horse Society, J. Sloughgrove, secretary, 12 Hanover square, London, W., England.
Shetland Pony.	Shetland Pony Studbook	Shetland Pony Studbook Society, Robert R. Ross, secretary, Balmoral Buildings, Aberdeen, Scotland.
Suffolk	Suffolk Studbook	Suffolk Horse Society, Fred Smith, secretary, Rendlesham, Woodbridge, Suffolk, England.
Trakehnen	Ostpreussisches Stutbuch.	Landwirthschaftlichen Central-Verein fur Litauen und Masuren, C. M. Stoeckel, secretary, Insterburg, East Prussia.
Thoroughbred	Australian Studbook	W. C. Yuille & Sons, Melbourne, Australia.
Do	General Studbook	Weatherby & Sons, 6 Old Burlington street, London, W., England.
Do	Studbook Francais	
Yorkshire	Yorkshire Coach Horse Studbook.	Yorkshire Coach Horse Society of Great Britain and Ireland, John White, secretary, The Grange, Appleton Roebuck, Bolton Percy, R. S. O., England.

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[2] See French Draft. [3] See Boulonnaise.

THE PRINCIPLES AND PRACTICE OF HORSE-BREEDING.

A. S. ALEXANDER.

In charge Department of Horse Breeding, University of Wisconsin.

Wisconsin Experiment Station Bulletin, No. 127.

UNIFORMITY AND PERSISTENCY IN BREEDING.

There has been general lack of these principles in our breeding operations, where imported animals have been employed. Farmers have attempted to improve their horses by grading-up, by which is meant, mating with pure-bred stallions until the blood of these sires shall have predominated over that of the native stock and stamped the characteristics of the pure breed upon the resultant progeny. Every step taken in this direction has been well intended and the results would have been highly satisfactory had the breeders continued to breed on and up by successive top-crossing with sires of the same breed. Five or more of such top-crosses are required to obliterate the native blood in the combination and, in fact, constitute practical purity of blood, according to the requirements of some of the stud books. But breeders here, as elsewhere, have followed no concerted plan in their grading-up operations. They have commenced right, but gone wrong shortly, by mating the female progeny with horses of another pure breed—one different from the first one used, yet possibly of as good type and character. All sorts of crosses have been made in this way, the result being that most of our horses are of mixed breeding and many of them mere mongrels and misfits. Out of this heterogeneous collection of nonentities a few phenomenally good individuals have been found and they have at once attracted the eye of the buyer and realized an appreciative price. While fine individual animals are sometimes produced by mixed breeding or cross-breeding, there is nothing definite about such mating methods and the progeny is much more apt to be nondescript than above average. The only certain method of raising the general average of our horses as regards type, quality, character, action and specific utility must come from persistent breeding to sires of the same breed until the blood of that breed has wholly obliterated the impure, or native blood derived from the mares originally used. Where this is done the resultant progeny will be pure in blood, to all intents and purposes and, to the same extent, true in every character and quality of the pure breed employed. Naturally, then, we should find among these animals, graded up to practical purity of blood, general excellence of form, quality, action and utility, such as characterize the breed used in the work of improvement, and such is the case, as a general result, wherever this course has been pursued.

To make our argument more clear let it be said that if the owner of a brood mare, or number of mares, of selected type but of native or mixed blood, starts to grade-up by mating them with a pure-bred Percheron stallion, that breed should be used right along, year after year, until all of the native, or mixed blood has been overcome and obliterated by the Percheron blood. This is to be done by castrating and selling all of the male progeny and weeding out all poor individuals of the female progeny; then mating the selected grade fillies each time with Percheron stallions. As already stated, at least five top-crosses of pure Percheron blood must be used in this way to obtain practically pure bred Percheron stock from a scrub or mixed-bred foundation and, when these crosses have been put on, the owner would be foolish indeed to mar it by the admixture of alien blood. The same principle applies to whatever breed of horses is started with. That breed should be persisted with until its characteristics predominate in the blood of the entire horse-stock of the farm, and if the breed commenced with was suitable for the district and the market and the horses in general were fully fed for perfect development and obtained from sound sires and dams, the resultant stock would be marketable at remunerative prices to buyers of the particular class of horses bred. During the grading-up process every out-cross to a sire of other blood than the one commenced with will set the entire operation back to where it started. Should a number of outcrosses be made the process is not grading-up but standing still, or retrogressing, and the stock bred will have neither definite character nor certain value.

We have been using pure-bred sires, to a greater or less extent, for upwards of fifty years, yet few, if any, districts have persistently used such sires in a right line until the character and quality of any one breed have become predominant and the breeding district consequently noted as a center for excellent horses of the breed chosen and, therefore, attractive to the buyer in need of that market commodity. In Wisconsin, as elsewhere, we should have many centers noted for the annual production of numbers of horses of standard breed, quality and character and we can in time create numerous centers of this kind by uniformity and persistency in breeding.

The success achieved in the breeding of Clydesdale horses in Canada serves as a good example of what can be accomplished by persistency and expert selection. The Scottish element of the Dominion's population has been partial to the Clydesdale breed and conversant with its good qualities and utility, hence imported Clydesdale stallions of the best character have been largely employed in the breeding operations of that country since the year 1842. Practically speaking, no alien crosses have been made, and the average farmer has been capable of selecting suitable mares and of adequately developing their progeny. The result is that Canada has but one type of draft horses, and it is a good one, showing, to a high degree of excellence, all of the breed characteristics of the pure-bred Clydesdale. This fact becomes evident and is interesting to one who stands on a street corner in Toronto and watches the team horses as they pass. That they are largely uniform in type, color, conformation, weight and action is most striking and speaks well for the intelligence and enterprise of Canadian horse-breeders. The same thing is true, to an even greater degree, in Scotland where the Clydesdale breed predominates and has been developed to a high state of purity, breed, character, and utility. On the contrary, if we examine the average team horses of Milwaukee or Chicago, we shall see every possible type and character represented and plain evidences of mixed breeding, careless selection and incomplete nutrition.

In addition to what has been said, relative to uniformity and persistency in horse-breeding in Canada and Scotland, it may be added that the district of La Perche, in France, has become famous throughout the world for one breed of horses—the Percheron, so true to type and of such marked breed prepotency. Belgium also furnishes a well-developed and perfected draft breed, and certain districts in England are famous for their ponderous, pure-bred, prepotent Shire horses. These breeds, and all of the others described elsewhere in this bulletin, have resulted from the methods of breeding here advocated and they prove indubitably that the practice of such methods can but prove satisfactory and profitable. We have originated and perfected the American trotter by similar means and might have bred up to purity with every one of the breeds utilized with the intention of improving our horse stock, but largely with the effect of increasing the numbers and imperfections of our hosts of nondescripts and mongrels. Need it be added that is it high time to follow the example set by those breeders to whom we owe our pure breeds of horses and by like methods, persistently and intelligently followed, make Wisconsin celebrated for the uniform and general production of horses of distinct varieties, practically pure blood and eminently useful and profitable qualities.

GRADE SIRES OBJECTIONABLE.

In the process of "grading up" the first progeny, from the mating of a pure-bred sire and a native or "scrub" mare, is a half-blood, the second cross one-quarter, the third, one-eighth, the fourth, one-sixteenth and the fifth, one-thirty-second. The fifth cross is thus shown to possess very little of the original blood of the native or scrub dam and it may have all or most of the breed characteristics of the sires used. In some instances less than five top-crosses of pure blood will be necessary to stamp upon the progeny the breed characteristics of the sires and, indeed, there are some cases where the colt of a native or scrub mare of good character looks almost if not quite, as perfect in form and quality as his pure-bred sire. This fact demonstrates the prepotency of the sire—that power which a pure-bred animal, from a long line of pure-bred sires and dams, has of transmitting to his progeny his breed characteristics and individual character, traits and quality with a great degree of certainly. It is prepotency of breed that makes it possible for an Aberdeen-Angus or Galloway polled, black bull to beget a large proportion of black, polled calves from different colored, horned "scrub" or native cows. It is this prepotency that enables the individual bull or stallion to transmit not only his breed characteristics but his individual excellence of form, propensity and character. Prepotency of both breed and individual come only from a long line of ancestry in the breeding of the individual animal. The grade, whether he has one cross or five crosses of pure-blood in his veins, possesses prepotency only in the degree to which he has been bred pure. That prepotency is slight in the five-top cross grade and practically *nil* in the one that has but one top-cross. For this reason, no matter how attractive may be the form, character, quality and disposition of a grade stallion, he is likely to lack both breed and individual prepotency, hence his progeny will, as a rule, favor the "scrub" side of his ancestry more than the pure-bred sire, seeing that the prepotency of the "scrub" is the stronger of the two elements. Further, it should be borne in mind that true grading-up can only be done by means of a pure-bred sire. The offspring of the grade sire with a grade female makes no advance in breeding. The resultant progeny is a grade, no higher and no lower than his parents as regards breeding. Nature sometimes creates what are termed "sports". Such animals often are of phenominal quality and character in one or another respect, but the superior qualities are not due to prepotency of either breed or individual, hence their possessor cannot be depended upon to reproduce them in his progeny. A certain "scrub" or grade stallion may, for example, develop unusual speed and by reason of it gain prizes on the race track, but, if used for breeding purposes, his unique powers for speed are not transmitted to his foals, as they have not descended from a long line of ancestors noted for like speed. He lacks breed and individual prepotency and, for that reason, should not be used for breeding purposes. Success in the breeding of fast horses comes from the mating of stallions and mares that come from families long noted for the possession of speed. Speed is an inherent possession of our trotting breed of horses and has come from selection and line breeding, with that feature in view, until prepotency to produce speed qualifications in the progeny has become an inherent characteristic of the breed, as a whole, while certain families and individual animals possess this prepotency to a greater degree than others. In all of our pure breeds of horses breed prepotency is a fixed character to a great or less degree, and, for that reason, pure-bred sires should be used. Grade sires, on the contrary lack both breed and individual prepotency and should, therefore, not be used for breeding purposes. There are exceptions to this rule, as there are to others, but, as a general proposition, the use of grade sires for breeding purposes has been found detrimental and is not practised in any country that has originated and perfected a breed of pure-bred horses. It should be discontinued in Wisconsin, and not until this is accomplished can we possibly succeed in producing horses of the highest type and quality.

CROSS-BRED SIRES UNRELIABLE AS BREEDERS.

The offspring of two animals of distinct and different breeds is termed "cross-bred". If, for example, a Clydesdale stallion is mated with a Percheron mare the resultant progeny is necessarily one-half Clydesdale and one-half Percheron. Two distinct and different breed prepotencies have been merged together in making this cross and the identity of each has been lost. The two currents of blood have mixed together and the direction of each has been diverted into a new channel. The two currents have come together from different directions and by opposition the flow has to a great extent ceased. The cross-bred animal thus produced may and often does appear better in many respects of conformation than either of the parents. This is well seen in the steers and heifers of cross-breeding exhibited so successfully at the International Live Stock Exposition and other similar fat stock shows. Such animals are often of superlative merit and quality in shape and in propensity to lay on flesh and fat rapidly, evenly and upon the most profitable parts of the frame. But they never are used for breeding purposes. The breeder understands from experience that animals thus bred lack prepotency of breed and individual and, therefore, cannot transmit the perfections of their conformation and character to their progeny. The preotency of such animals, if present, is a mixed one. There is no prepotency in a direct line, for the production of a specific breed character.

If used for breeding purposes a male of this breeding has no power to transmit his individual characteristics while his breed characteristics being an alloy of those of two distinct breeds cannot be transmitted. The crossing of two distinct breeds of horses-apart from the legitimate and advisable crossing of a pure-bred upon native, "scrub" or grade mares with the intention of persistent work in the same direction until purity of blood is arrived at—is to be considered detrimental and as surely productive of disappointing results as the similar employment of grade sires. The so-called "Select Clydesdale" is a cross between the pure-bred Clydesdale and English Shire—two distinct but somewhat similar breeds—and cannot be expected to perfectly transmit the characteristics of either Clyde or Shire. This cross produces first class horses to be gelded for heavy draft work and the females are eminently suitable for similar labor. They should not be used for breeding purposes, however, unless to successively top-cross them with sires of one pure breed—either Shire or Clyde according to the preference of the breeder—so long as the breed chosen is exclusively and successively used. These truths apply with equal force to every combination of two pure breeds and our breeders will do well to reject for breeding purposes all stallions shown by their pedigrees to be cross-bred.

VALUE OF PEDIGREE.

The pedigree of a horse is simply a record showing the animals that have in succession entered into the breeding of the individual. It shows too that he belongs to a distinct breed, possessing, therefore, the prepotency of that breed and in addition to this possession it guarantees a certain degree of individual prepotency, dependant upon the excellence and known prepotency of the ancestors on each side of the pedigree. To insure both breed prepotency and individual prepotency the animal represented by the pedigree should have several recorded animals upon the dam's side and the more and better the mares the more certain will be the good breeding qualifications of the pedigreed animal.

The sires should be of equal merit and the most important point is to see that they are of known purity of blood and individual excellence; also that upon neither side is there an objectionable out-cross or the presence of a sire or dam noted for unsoundness or other objectionable trait, character or feature. Furthermore, the character of the man back of the pedigree should be taken into account. The pedigree is comparatively valueless unless the breeder and seller are noted for integrity; nor is pedigree a sufficient criterion of merit, or an apology for individual imperfection, or unsoundness. The animal should be a good individual and if, in addition, there is a long line of excellent ancestors upon both sides of his pedigree, there will be good reason to expect that he will, with considerable fidelity, transmit to his progeny the true characteristics of his breed, those of his family and those of his individuality.

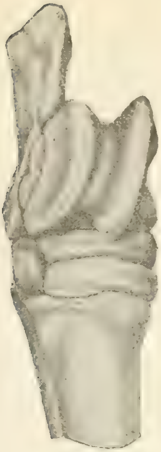
In some instances an individual horse with a long line of reputable ancestors is himself a comparatively poor individual yet may prove an impressive sire and, on general principles, the somewhat indifferent individual that has a fine line of ancestors, as shown by his pedigree, is greatly to be preferred to a "scrub," grade or cross-bred animal, for breeding purposes. We say this for the good reason that his progeny will be quite likely to partake of the good qualities of the ancestry, rather than the indifferent qualities of the individual. There are many exceptions to this rule, and experiment is, therefore, the sure way of proving the prepotency of the individual stallion. It is always best, however, to choose a sire that has both excellent breeding and individual excellence of form and quality in every respect.

RECORDING AND PUBLICATION OF PEDIGREES.

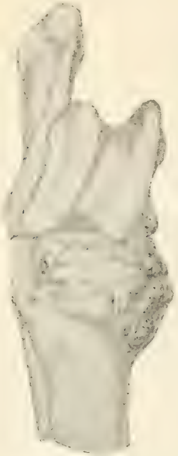
Every sound, pure-bred stallion and mare should be duly recorded in the stud book of the breed represented. Breeders should attend to the recording of colts and fillies at the ages indicated by the rules of the various pedigree registering associations and delay in attention to this matter entails considerable expense, as higher fees are charged for the recording of adult horses than are asked for horses under one year of age. Members of the different stud book associations are charged less for recording horses than are outsiders. It is, therefore, advisable that every breeder of pure-bred horses, that are eligible to registry, should become a member of the association publishing a stud book for the breed which he handles.

IMPORTANCE OF SOUNDNESS IN BREEDING STOCK.

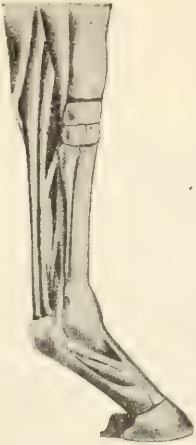
It has been stated that the stallion should be pure-bred, recorded, certified to as regards breeding and an excellent individual. It is of as great importance that he should be free from all forms of unsoundness or disease that are hereditary, transmissible or communicable to offspring. It is equally important and necessary that the mares bred to him should be sound in the same way and not until both mares and stallions used for breeding purposes are free from unsoundnesses such as we have indicated, can we confidently hope to raise the average excellence of our



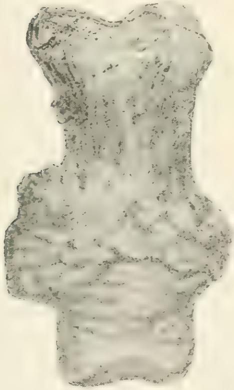
SOUND HOCK JOINT



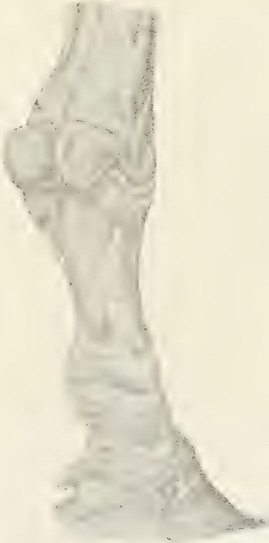
BONE SPAVIN.



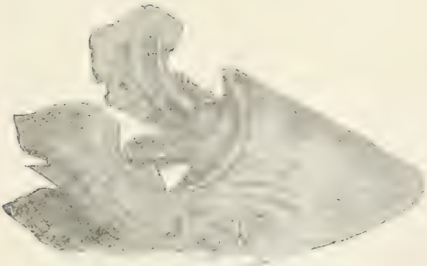
TENDONS OF FOOT.



RING BONE.



BONES OF THE FOOT.



SIDE BONES.

horse product to the high plane possible as the result of intelligent breeding and development.

Many imported and home-bred stallions are unsound and transmit to their progeny the predisposition to like unsoundness. This equally is true of the mares used for breeding purposes throughout the state, for many farmers have fallen into the grevious error of considering any broken-down, halt, maimed, blind or otherwise unsound mare fit for breeding purposes, when no longer able to work in harness.

Every breeder should have a clear understanding of the diseases and unsoundnesses that may correctly be deemed hereditary and transmissible, either is fact or as a predisposition. On general principles it may be confidently stated that blemishes and deformities due to accidental causes are not hereditary or transmissible, and do not, therefore, render the individual animal unfit for breeding purposes. In this category may be set down unsightly scars from barb wire injuries, or similar accidental causes; blindness, due to accident; lameness, due to injury; united factures not implicating the pelvis; causes, apart from disease, unfitting animals for labor. The greatest possible care must, however, be exercised in deciding these matters and, where possible, it is much the better policy to select for breeding purposes animals in the best of health and free from every form of blemish or unsoundness, on the principle that breeding material should be of the best procurable character and quality.

With the latter statement in mind it may be said that the following diseases should be considered hereditary, or transmissible as a predisposition; eye disease, such as periodic ophthalmia or "moon blindness;" cataract; amaurosis or "glass eye"; chorea, or "St. Vitus' dance", constituting "crampiness," or shivering;" "stringhalt;" "heavens" or "broken wind"; spavin; ringbone; sidebone; navicular disease or "grogginess", melanotic or pigment tumors; and peculiarities of conformation rendering animal liable to disease or lameness, such as "sickle", curby-formed, "crooked", "boggy" or "sprung" hocks; flat, weak, unsound hoofs; weak, ill-formed knees; "washy" coupling" short upright pasterns, etc.

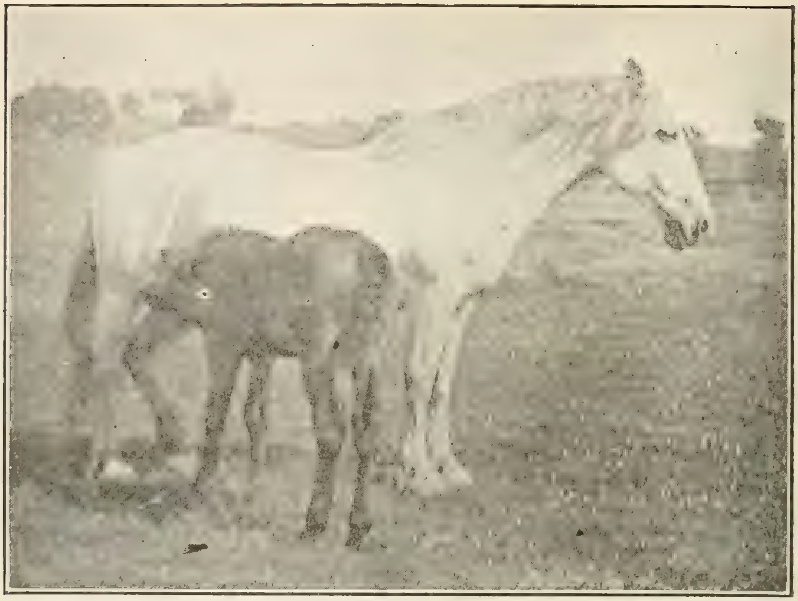
Among communicable diseases should be included glanders, farcy, "maladie du coit", infectious abortion, mange, leucorrhoea or "whites", urethral gleet and simple pox.

As a general principle it also is inadvisable and unwise to breed either stallions or mares that are temporarily sick from any ailment that impairs appetite, vigor, or constitution. The best results in breeding require perfect bodily and constitutional health in each parent and sickness of all sorts should be properly treated and perfectly recovered from before mating is permitted. A stallion's lack of success in begetting an average number of foals is often due to the poor or unhealthy condition of his mates. The stallioner, therefore, should carefully examine each mare, before service, for the protection of both the health and reputation of his horse while the mare owner should as carefully see to it that the stallion he intends patronizing is not only free from hereditary disease but perfectly well otherwise.

SELECTION OF BREEDING STOCK.

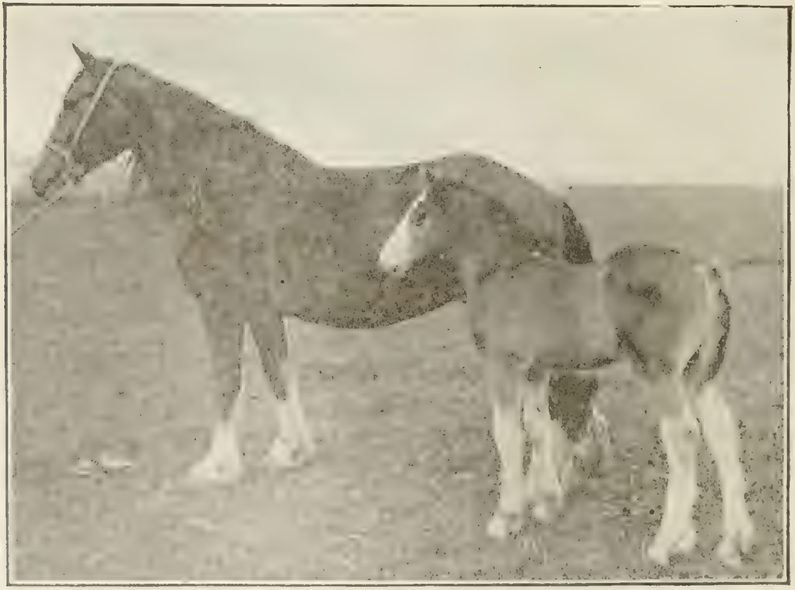
The general principle of heredity is that " like produces like". There are departures from this rule but it proves true in a majority of instances and it should be remembered that bad points and qualities are as likely to be transmitted and reproduced as the reverse. It is a serious but common error in breeding to suppose that the bad points of one animal can be fully offset or overcome by the good points of the other mate. The true principle of successful breeding is to couple two animals that are each as nearly perfect as possible. Errors in conformation are not to be offset by chosing a mate that is abnormally developed in the contrary direction. By mating with an animal perfect in the point where the other is imperfect there will be greater liklihood of success. For example if the mares in a particular stud are lacking in size and quality of hoofs the proper way to correct the fault is to persistently breed to sires that have perfect hoofs—not to use sires that have abnormally large hoofs. After each breeder has decided what he desires to breed he should select mares as nearly like his ideal as possible and then mate them persistently with sires of like type and known purity of blood. As the female progeny come to the age at which they may be bred, all that are lacking in desired type and quality should be rejected and the best mated with selected sires of the right stamp and blood. In this way progress will be made, but if indifferent mares and sires are used the general average will be kept down and the value corespondingly depreciated.

No matter what type of horse is decided upon both sires and dams should have strong, well-knit bodies; large, sound joints; strong, sloping pasterns and true, balanced, sprightly, correct action. Bones should be clean and free from coarseness so that the legs appear wide and flat. Tendons should be prominent and free from meatiness and hair fine, silky, glossy and, in heavy draft breeds having "feather" upon their legs, this hair should spring as a fine, silky fringe from the back tendons and should not grow upon the sides of the leg. The "feather" is not valuable in itself but it indicates the character of the skin from which it grows, and the quality of bone underlying the skin. If the hair is fine, silky and free from curliness and coarseness it may be taken as an indication that the bone is dense and ivory-like in texture, hence of good lasting quality, and where this is the case, the temperament of the animal is likely to be vigorous and the constitution hardy and healthy. Coarse, kinky, profuse hair, that tends to grow from the sides as well as the back of the legs below hocks and knees, usually indicates coarseness, grossness, sluggishness, spongy bone and tendency to disease such as "grease", and lymphangitis ("milk leg" or "Monday morning disease"). It is advisable, then to select stallions and mares for breeding purposes that have clean, wide, flat legs, given that appearance, not by flatness of bone, as commonly supposed, but by size of bone and great development of tendon. No one point, however, is of more importance than sound, well-shaped, fully-developed hoofs, of tough texture. Stallions or mares having poor hoofs—too small, too large, too soft and spongy, too weak, brittle and wide and low in the heels, too shallow and flat, too steep and



GOOD TYPE GRADE PERCHERON BROOD MARE AND FOAL, DANE CO., WIS.

Photo by Neilson.



GOOD TYPE GRADE CLYDESDALE BROOD MARE AND FOAL, ROCK CO., WIS.

Photo by J. Z McLay, Janesville, Wis.

contracted—are not, as a rule, desirable for breeding purposes. The wearing qualifications of the individual horse depend largely upon the character of his hoofs. The price, when it comes time to market him, will as largely depend upon the same point. The buyer discriminates against all forms of disease and weakness of the foot and the horse that is of superior quality "at the ground" will sell for an appreciative price on that acount. 'Foot sore" mares may be safely used for breeding purposes provided the condition of their hoofs is not due to actual hereditary disease, or an inherent susceptibility thereto. If the feet are simply weak and worn from prolonged service and the bad effects of continued shoeing, these conditions will not be likely to descend to the progeny. In selecting such mares, however, care should be taken to decide that the weak condiitons have not early appeared as the result of bad conformation. Stallions having very wide, shallow, flat feet beget progeny prone to foot troubles and especially to sidebones. Where it can be avoided such horses should not be bred to and they should in every case, be free from sidebones. If due care is taken to breed from sires and dams having sound, well formed, fully developed feet the progeny will usually inherit the tendency to develop feet of similar excellence and the owner should then see to it that the hoofs are trained in the way they shoudl grow while the colt is developing.

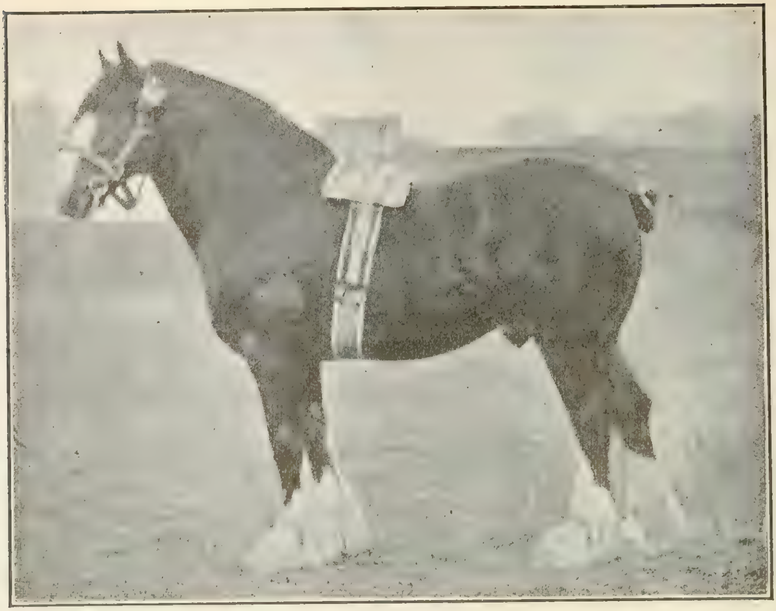
Sound hoofs are the product of breeding, as has been stated, but it is necessary also to feed nitrogenous food, including oats and bran, seeing that horn is a product of the protein elements of the ration (keratin) and does not so perfectly develop when corn is the chief grain utilized in the feeding of growing animals. Low-lying, wet, alluvial, humus-rich soil, and the classes of food there produced are somewhat unfavorable for the production of dense tough, good-wearing hoof horn. Mineral matters in the soil, food and drinking water favor sound hoof production.

Breeding stock should be selected that is of the right type for the production of the class of horses desired, and in addition to rejecting unsound and imperfect animals those of bad temper, intractable disposition, or other objectionable trait should likewise be avoided.

We recognize the fact that absolutely perfect animals can rearly, if ever, be found and that of our breeders can afford to respect breeding stock for small and unimportant defects. There can, however, be not the slighest dougt that it would be to the great advantage of each breeder, and to the horse-breeding industry of the state, were all actually unsound and notably unsuitable stallions and mares rigorously rejected when selecting breeding stock.

IMPORTANCE OF GENEROUS FEEDING.

In seeking to improve our horse stock, breeding and selection makes success possible, but will fail wholly or partially unless animals of all ages and stages of development, used as material in the operation, are at all times provided with a full supply of the most suitable food. Many a man has fallen short of success in breeding by depending upon blood



NOTED PRIZE WINNING CLYDESDALE STALLION, MARCELLUS(11110)
Showing quality of bone and "feather" and sloping pasterns typical of the Scottish breed of draft horses.

PURE-BRED PERCHERON MARE AND FOAL.
Property of Wisconsin College of Agriculture.

alone to improve his stock. He has forgotten that all of our improved breeds of horses are the product of adequate nutrition as well as intelligent breeding, suitable environment, sufficient shelter and kindly care. The use of a sire so produced endows the progeny with the propensity to develop character and qualities akin to his own and of the breed he represents. But these desirable qualities will not perfectly develop unless the progeny is given food, care and shelter such as had their effect in the production of the pure breed and its high class representative. In all pure breeds the original "scrub" blood, at the foundation, is ever seeking to reinstate itself. In short there is a tendency in all pure-bred animals to degenerate or retrogress towards original and less perfect types and nothing will more surely and speedily stimulate this tendency than lack of nutritious food. In the absence of sufficient nutrition, or complete nutrition, the possibilities of perfection inherited from pure-bred sires or dams but partially materialize or wholly fail to assert themselves. The well-born, but incompletely nourished colt fails to develop and at maturity is no less a "weed" than the ordinary scrub or native animal. On the other hand, if the dam is adequately nourished on complete rations during pregnancy and when nursing, and the colt, from weaning time forward, is as perfectly and fully fed, it will, in all probability, develop to the high standard of size, power, quality and character made possible by its breeding.

In addition to proper feeding it is likewise necessary to protect the young developing animal against every possible cause of debility, discomfort and unhealth that would tend to retard its growth. Shelter must therefore be sufficient, disease must be fought against, vermin must be prevented from sapping the constitution, and fresh air, sunlight, adequate exercise and kindly care must take a full part in perfecting the development of the animal.

OVER-FAT CONDITION DETRIMENTAL.

In advocating adequate and complete nutrition we do not mean that breeding animals or young growing and developing animals should be over-fattened. We insist that each animal, according to its requirements for work, for service, during pregnancy, while nursing, while growing or in idleness, should be fully fed upon rations which supply a sufficient amount of the most suitable nutrients.

The breeding stallion derives no possible benefit from the load of fat that is too commonly put upon his frame by drugging and stuffing. On the contrary, such obestiy engenders sluggishness, disease and impotency. We should expect our draft stallions to transmit vim, vigor, activity, power and ability for hard labor. These desirable qualities are not associated with fat and flabbiness and can not, to any great degree, be transmitted by a stallion in that condition. To give the best results in breeding he should be in muscular condition and have perfect health and vigor. The requisite condition is that which comes from ample exercise, or actual labor, which bring into full play all of the tissues and organs of the body, keep down surplus fat by stimulating excretion and repairing waste of tissue, and, in short, favor in every way that condition and disposition which it is desired that every stallion should transmit to his offspring. As "like produces like" it is reasonable to expect that a stallion, capable of efficient work in harness, will be likely to procreate horses possessed of ability in the same direction; while fat flabby stallions, maintained in idleness and luxury, will be much less likely to impart vim, vigor, power and staying qualities.

Stallions exhibited at our leading stock shows and offered for sale throughout the state are often pampered in condition. Many of them for this reason fail to beget an average number of foals from their quota of mares, or beget foals that are weak in constitution, deficient in size or crooked in limb when born. The over-fat condition alluded to is not altogether the fault of the importers and dealers who handle such stallions. The average buyer admires, appreciates and demands plethoric condition. It is pleasing to his eyes and those of his neighbors who own brood mares, and he will not buy a thin horse for fear he will meet with on unappreciative reception and patronage in the breeding district to which he is taken. Naturally, then, the stallion salesman feeds for polish and plumpness, and the buyer is too apt to continue the process at home, with the result that the horse does not give the best of satisfaction, in number or strength of progeny. Under the circumstances, it is often good policy to buy young stallions in preference to matured ones that have long been pampered for show purposes or sale and such colts should be so fed as to develop them naturally and thus favor the best results from their use.

These matters require and deserve consideration from all concerned and the education of both stallioner and mare owner to the advantages to be derived from normal, healthy condition rather than abnormal and detrimental fatness and flabbiness in breeding stallions. The same truth applies with equal force to brood mares. The best results in breeding have come from the use of mares that have to work for their living during pregnancy. Over-fat condition in brood mares is detrimental; natural condition is beneficial. It is true that semi-starvation and overwork equally are to be avoided. The emaciated, run-down, tired workmare is no more fit to breed from than is the plump, idle, sluggish or unhealthy mare.

TRAINING HOOFS AND SHOEING.

It is absolutely necessary and very profitable to properly care for the feet of growing colts. If left to nature the foot will not always grow out full, strong and perfect in form. Where there is stone or gravel in the soil the horn wears off as fast as necessary to keep the foot in fair proportions, but the wearing is not always even, unless judiciously directed. On prairie soils, which are soft and do not wear the foot, the horn, growing rapidly is not kept in shape, with the result that the feet split, become uneven and, indeed, the entire bony column is not infrequently altered in form and the animal partially if not wholly ruined in consequence. It is due to this fact that we have so many bad-footed horses upon the streets of our cities. The blacksmith is apt to get all of the blame but the trouble really began upon the farm.

To grow feet in the best possible manner the colt should be driven into the stable once a month, when on grass, and the feet should then be carefully inspected. As a rule it is necessary, to shorten the toes and this should be done with the rasp; in fact no other instrument should be used for the trimming of colt's feet. Where the toes are kept short the quarters will usually take care of themselves, for the frogs will bear upon the ground and keep the heels properly spread. The frog should be particularly noticed for if it gets out of contact with the bearing surface, the foot will very rapidly lose its proper shape; the heels will contract and the walls at the quarters become brittle, weak and prone to split, either from above or below. Where a "quarter crack" appears it is a difficult matter to bring down a new growth of sound hoof without firing and blistering, so that prevention is all important. There is no need to cut out the sole or "open the heels" as it is called. The frog and heels should be left absolutely untouched and they cannot be too well developed. The sole will take care of itself, for nature will throw off dead horn as required. Keep the walls rounded at the ground surface, the toe short and the frog prominent and, with but few exceptions, horses will go to market in the best possible condition so far as the feet are concerned, to command a profitable price.

In this connection it may be added that sound feet are best produced by adequate feeding of nutritious food. Horn comes from the nitrogenous constituents (protein) of the food and, for this reason, a complete ration should be used for the growing of colt frame and sound hoof-horn, for corn alone cannot be depended upon to produce good, sound feet: Sudden changes of food, periods of sickness, exposure to inclement weather, for months at a time, all have an injurious effect upon the feet, therefore it is important to shelter the colt well, feed him regularly and generously and protect him as much as possible against the ravages of disease. Train the feet in the way they should grow and when they are mature they will not be so liable to depart from sound form and substance.

When the hoofs have been properly developed they are very apt to be quickly and injuriously changed in shape and condition by the erroneous, hurtful methods of a blacksmith who has not studied the anatomy of the horse's foot. The owner should supervise the shoeing of his horses, and in addition to the use of shoes of proper weight and form, the following points should be attended to: the frog is to be left untouched by knife or other instrument; only that portion of the sole which is dead and loose is to be removed; the bars are to be left alone; the heels are not to be "opened" by a couple of deep notches; the outer surface of the walls is not to be rasped, with the exception of a slight depression under each nail point to allow of proper clenching; the shoe is to be fitted to the foot and not the foot to the shoe; the shoe is not to be applied to the sole when red hot, unless a light touch is necessary to show where horn must be rasped away to furnish a proper seat for the shoe; the rasp is always to be used in preference to the knife or buttress; shoes should be reset, or replaced, once a month; nails should be of the best quality, not too large and not driven too high, or too close to the sensitive structures within the horny box of the foot; the feet are to be kept as truly level as possible and while keeping the toes comparatively short, the heels are not to be unnaturally lowered.

PREVENTING NAVEL AND JOINT DISEASE OF FOALS.

The trouble from navel and joint disease in foals may be successfully prevented. In the first place it should be understood that the disease is due to filth germs gaining access to the system of the foal by way of the wide open umbilical vein of the navel at birth. When germs enter they set up irritation and inflamation, pus forms and is absorbed into the circulatory system from the original abscess at the navel and secondary abscesses form in other parts of the body, notably the joints of the extremities. The affected foal is found to be suffering from heat, pain and swelling of say a hock joint and the attendant takes it for granted that the mare has caused the injury. Next day another joint may be affected and in bad cases abscesses not only form in the joints but may involve the throat or poll. It is comparatively rare that an affected colt can be saved after the disease has progressed to the stage of pus formation in the joints or elsewhere and those that recover are likely to prove "weeds" for the balance of their lives.

It is far better to attempt prevention of the disease than to have cases of it to treat,, and simple hygenic measures will prove perfectly successful where properly carried out. In the first place the mare should bring forth her foal in a box stall especially prepared for her. Preparation consists in removing every particle of bedding, litter and dirt. Saturating the floor with a strong solution of disinfectant, such as four ounces of sulphate of copper to one gallon of water, should be the next step and the walls ceiling and partitions are to be treated in the same way. Then whitewash everything. In the fresh made lime wash mix a quarter of a pound of chloride of lime to each pailful and if possible apply by means of a spray pump which forces the wash into every nook and cranny of the wood or stone work. Put in fresh bedding when the above measures have been carried out. This is to be done each time box stall is to be used by a mare about to foal.

Have two boxes set apart for foaling, keep each of them in the condition above advised when foal is born, has been attended to and mare has "cleaned" and been washed, turn mare and foal into second box and at once prepare used box for next mare. When the foal comes, immediately wet its navel with a solution of half an ounce of corrosive sublimate in one pint of boiling water acidulated with one dram of hydrochloric acid. When cool, color this solution with a couple of drams of tincture of iron and label "poison". After applying the medicine to the navel, wash the foal's belly with a 2 per cent. solution of coal tar disinfectant and use the same strength wash for the udder and genitals of the mare before the foal is allowed to suck. Repeat the applications of strong solution at least twice a day until the navel cord dries up, drops off and there is no raw spot left. The applications to the udder and genitals of the mare should also be repeated twice daily until all discharge from the vagina subsides. The strong disinfectant solution applied to the navel at birth destroys any germs present and the after applications keep the part absolutely free from germs besides having cauterizing and astringent effects which are highly beneficial. As it is often necessary to tie the foal's navel at birth always be careful to use a cord that has been kept soaked in 5 per cent. solution of coal tar disinfectant, carbolic acid, or 1-2000 solution of corrosive sublimate. After tying cord apply the strong corrosive sublimate solution as above prescribed.

Where this treatment is followed carefully navel disease will not occur and there is the added benefit of preventing a form of scours which is also due to infection of the navel. Where personal attention cannot be given several times a day the work may be lessened by covering the navel with antiseptic cotton on which has been freely sprinkled a mixture of one dram of iodoform and seven drams of boracic acid. This should be used after wetting the navel with the strong corrosive sublimate solution and is to be held in place by a wide bandage around the body. The dressing should be renewed once daily until the navel has healed.

THE BREEDS OF HORSES.

Our modern breeds of horses, descended from the original wild horses of Europe, Asia and Africa, owe their peculiarities of type, character and conformation to the effects of environment and selection.

Where food has at all times been abundant and the climate mild, weight of body and size and strength of bone have naturally developed in the horses there raised, while opposite conditions have tended to lessen size and refine the frame. The heavy draft horses are descended from the large, more sluggish and somewhat ungraceful horses at one time common in the low, flat regions extending from the North Sea to the Euxine; the horses of lighter conformation descend from the Arabian, Barb, Turkish, Persian, Spanish and other similar horses developed in regions that were comparatively hot, dry and unproductive and "where a sparse supply of food made frequent changes of grazing ground a necessary essential of existance" and caused them to become "distinguished for spirit, activity, speed and endurance."*

THE THOROUGHBRED.

The name "thoroughbred" belongs solely to the British racing horse, or "blood horse," and should not be used in speaking of any other breed. This breed was founded by mating native British mares of mixed blood with stallions of Oriental blood—such as the Arab, Barb and Turk—with the object of obtaining horses noted for fleetness and endurance. The following Oriental stallions were most prepotent in founding the breed: White Turk, the Byerly Turk, the Darley Arabian and the Godolphin Barb, and their blood descends in the male line through such noted modern sires as Herod, Eclipse and Match 'Em. The Racing Calendar was published in 1752; a list of distinguished sires in 1786 and in 1791 the

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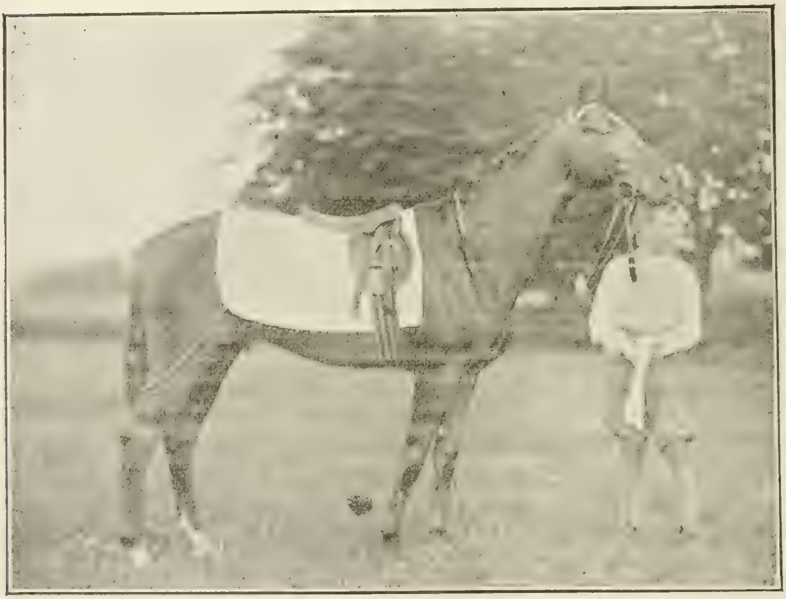
*Sanders' Horse Breeding, pp. 184-185.

English Stud Book took its present form. The stud for American thoroughbreds was established in 1868. The leading throughbreds imported to this country at an early day were Precipitate, Priam, Diomed, Trustee and Glencoe.

Characteristics.—The thoroughbred has been developed to run fast and has all the requirements of form, quality, ambition and endurance for that purpose. The common colors are bay, brown and chestnut. A typical specimen of the breed should stand 16 hands high, have a clean-cut, refined make-up, long, graceful neck, deep chest, long body with well sprung ribs, strong loins, straight croup, long thighs and sloping springy pasterns, fine "gun metal" bone, clean, firm muscles, active, high-strung temperament.



TYPICAL THOROUGHBRED STALLION.

Utility.—Owing to long continued breeding in a right line prepotency has become so thoroughly fixed that the thoroughbred stamps his breed and individual character upon his offspring with marked fidelity. Mated with suitable mares his progeny is suitable for road, carriage and saddle work and such mating of ten to twelve hundred pound trotting mares, that do not possess notable speed, would be likely to produce offspring of considerable value for one or other of the purposes mentioned. The thoroughbred has been used in the formation of our coach breeds, the American trotter and the American saddler. He is now little used in the breeding of the two last types of horses but, if possessed of high, attractive knee and hock action, may be employed with success for the production of coach horses. In selecting sires of this breed care should be taken to avoid those having irritable or vicious temperament, and too long, weak bodies, legs and pasterns.

THE AMERICAN TROTTER.

As the thoroughbred was, in England, originated to supply the demand for a perfect running horse, so the trotter has, in America, been bred for the special work of fast driving upon the race track and road and, for that purpose, surpasses all other horses. The French and Orloff (Russian) trotters have been developed similarly in their respective countries and have become noted for long distance performances, but at all distances American trotters now hold the fastest records. The Narragansett pacers of New England were our first road horses but became practically extinct, at the beginning of the nineteenth century. About the year 1788, when Messenger was imported trotters were becoming popular and since then, have been bred in increasing numbers and of gradually increasing speed. Messenger sired Mambrino and the latter Mambrino Paymaster and Abdallah and from these have sprung Mambrino Chief and Rysdyk's Hambletonian, respectively, both founders of noted families. The dam of Rysdyk's was the "Charles Kent Mare", sired by Bellfounder, a Hackney, foaled in Norfolk, England. The leading families are (1) Hambletonian, founded by Rysdyk's Hambleton, including such noted sires

TROTTING STALLION SIDNEY DILLON 23157.
Sire of Lou Dillon, 1:58½; Dolly Dillon, 2:06¾, etc.

as Gregory Wilkes, Electioneer, Happy Medium, Abdallah 15, Robert McGregor, Almont, Belmont, Nutwood, Dictator, etc. (2) Mambrino Chief, including Mambrino Patchen, Clark Chief, etc. (3) Clay, founded by Andrew Jackson, and tracing to Arabian ancestry and including, among the most noted, The Moor, Henry Clay, Young Clay, Pilot, etc. (4) Morgan, founded by Justin Morgan, of which Ethan Allen, Daniel Lambert, Ben Franklin, and General Knox are the most noted. (5) Pilot, the most noted of which was Pilot, Jr. The Hambletonian blood when fused with any of these has been especially prolific in producing performers.

Characteristics.—As already noted the chief characteristic of the breed is speed at the trotting gait. Prepotency to reproduce speed has been highly developed and endurance, ambition and conformation, suited to the work, go with it. The best specimens of the breed have intelligent heads, light necks low, deep chests, sloping shoulders, long forearm short cannons, well sprung ribs, strong loins, long croup, long, strongly muscled thighs, dense bone and prominent tendons. In some families size and quality have been largely secrificed to speed; in others these points have been preserved and enhanced so that the individuals are fit for carriage work, although less noted for speed.

TROTTING BROOD MARE ERALMA AND FOAL.

Utility.—Carriage horses, roadsters and pacers are all produced within the confines of the trotting breed. For the production of race track performers, established lines of brood must be followed, and the type produced in such effort in unlike that of the stylish carriage or coach horse. The latter types require sires and dams of large size, high, or essentially graceful, action, smoothness of finish and symmetry of conformation. Such mares cross well with the thoroughbred, the trotter of like type, the French and German coach horse and the English Hackney. The pacing gait is somewhat accidental, but breeding in line may be expected to insure pacing conformation.

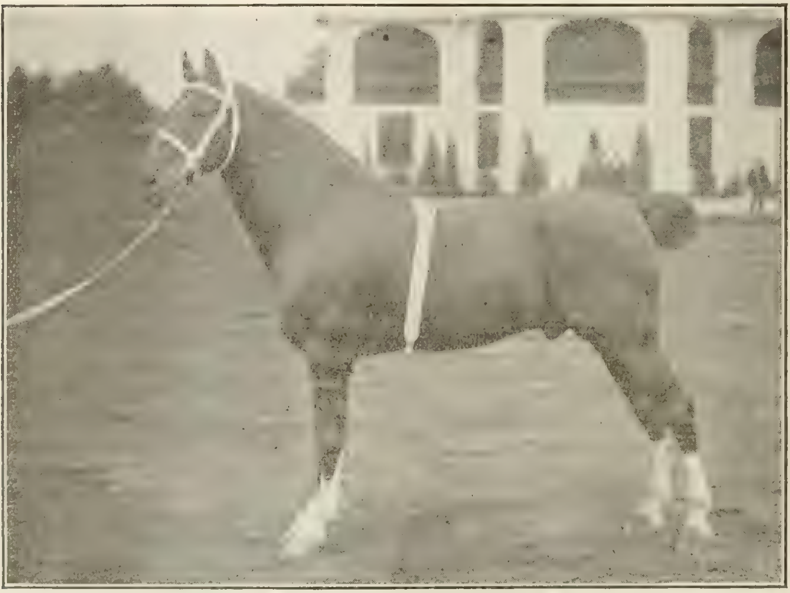
THE SADDLER.

The business of raising and training saddle horses long has been given careful attention in Kentucky, Tennessee, Missouri and the southern portions of Ohio, Indiana and Illinois and, to a less degree, of late years, in many other parts of the country. The work has been eminently successful and a distinct, prepotent, fairly perfect breed of saddlers has been created. American "gaited horses" are most popular throughout the country and their schooling has been brought to a high plane of perfection. Of recent years the "walk, trot and canter" saddle horse, such as is popular throughout Great Britain, has come into vogue. This class includes most of the hunters but many trotters have been exported for use in the hunting field and have in many instances quite equalled the Irish hunter in the field. In the breeding of saddlers performers occasionally are found among various blends of blood, but for assured success in production, mares of saddle horse blood or of trotting blood, if of correct conformation, should be used in preference to all others and should always be mated with a pure-bred, recorded saddle horse.

CELEBRATED KENTUCKY SADDLER REX MCDONALD.
Photo from Sanders Pub Co.

THE HACKNEY.

This breed originated in the country of Norfolk, England, through crossing thoroughbred stallions with native Norfolk trotting mares, which were noted for great speed and endurance. Imported Bellfounder, sire of "Kent's Mare", dam of Rydyk's Hambletonian, was a Norfolk trotter, with a record at six years of nine miles in 29 minutes, 38 seconds. His dam Velocity in 1806 trotted on the road 16 miles in one hour and in 1808 trotted 18 miles in one hour, 47 minutes. The mating of Blaze, a son of the thoroughbred Flying Childers, with the Norfolk mares, did much to produce the type presented by the animals just mentioned. Flying Childers was sired by Darley Arabian, so prominent as a founder of the thoroughbred. Blaze sired Shales, the sire of Driver, the sire of Firefly, and, to the latter trace most of the noted Hackneys of today, including Rufus, Confidence, Lord Derby, Triffit's Fireaway, Danegelt, Goldfinder, Field Marshal etc.



TYPICAL ENGLISH HACKNEY STALLION MCKINLEY.

Characteristics.—The typical Hackney is a stoutly built, compact, smooth, strong-boned, muscular horse of aristocratic appearance and kindly disposition. His graceful plumpness and the perfect curving of his outlines make him essentially a "gentleman's horse", perfectly adapted to carry fine harness and draw a handsome equipage in the park or on the boulevard. His head is light, clean-cut and countenance intelligent; neck strong, well arched, muscular, but free from coarseness; shoulders smooth and oblique; body rotund, short, compact; hips smooth; quarters plump with muscle; legs short, strong-boned, flat;

tendons prominent; hoofs symmetrical and of good quality. His action is high, round, quick, elastic, regular, not only in front but behind, the hocks being perfectly flexed, to balance the "trappy" action of the knees. The common colors are bay and brown; height 15.1 to 15.3 hands.

Utility.—The Hackney having been bred pure and true to his present type for over one hundred years possesses strong prepotency to stamp his breed and individual character upon his offspring and is, therefore, splendidly fitted for mating with selected trotting mares, or mares of mixed breeding, for the production of stylish, high-stepping coach and cob horses for use in the cities. The mares selected for this work should approximate Hackney type as closely as possible and their offspring, from the service of a Hackney sire, may be confidently expected to possess natural, inherent, coach action, which may be further developed and perfected and by shoeing and training.

CHAMPION FRENCH COACH STALLION PERFECTION, AT 19 YEARS OLD.

THE FRENCH COACH HORSE.

As indicated by the name, this breed originated in France, where for many years it has been termed "Demi-Sang" (half blood), being the product of a cross between the English thoroughbred and native mares of France that have considerable Oriental blood in their veins. Since 1780 the French government has assisted and supervised the breeding of horses in France. Government horse-breeding studs are maintained at Pin and St. Lo, under the management of a director general, with qualified assistants. In 1883 a stud book was established by government decree for the recording of pedigrees of stallions used in the government studs. Stallion colts are inspected annually as to soundness and conformation, and "approved", if sound and suitable. In 1885 a decree was issued excluding from public service all stallions not authorized by the government. To encourage the use of the best stallions, and discourage their exportation, the government allows annual subsidies to selected horses, as follows: Thoroughbreds, $150 to $500; coach, $75 to $150; draft, $50 to $100. The thoroughbreds have not, it is alleged, been much used since 1840 in the breeding of French coach horses.

Characteristics.—The typical horse of this breed stands 16 hands high or over, weighs 1,200 to 1,400 pounds, and is, in all essentials, a coach or carriage horse. He is more rangy in type than the Hackney; an up-standing, graceful, free moving, strong horse; bay, brown or black in color, and possessed of high, airy, knee and hock action, which, however, is not so "trappy" as that of the Hackney. Some of the horses of this breed incline to coarseness, and, while true to type personally, do not successfully repeat it when mated with mares of trotting or mixed blood. Others are of more refined type and great prepotence, while many of them possess considerable speed, owing to admixture of French trotting blood. In general make-up evidences of thoroughbred type are still plainly apparent, but the breed is gradually improving in essential breed character and prepotency.

Utility.—They are suited for the production of large, handsome coach carriage and "wagon" horses, when mated with mares that are strongly possessed of the conformation, quality and character essential in the dams, as well as the sires of such stock.

THE GERMAN COACH HORSE.

The Coach horse breeds of Germany have been formed by mating thoroughbred horses with native mares of Arabic origin. This work has been carefully carried out for many years and the resultant horse is, therefore, fairly well fixed in breed type but still shows some evidences of "cold" blood. Government stables have been established for the production of these horses and government supervision as regards soundness and suitability is similar to that enforced in France. It is said that horses of this type were found in Germany as early as 1608 and that registration has been enforced since the sixteenth century.

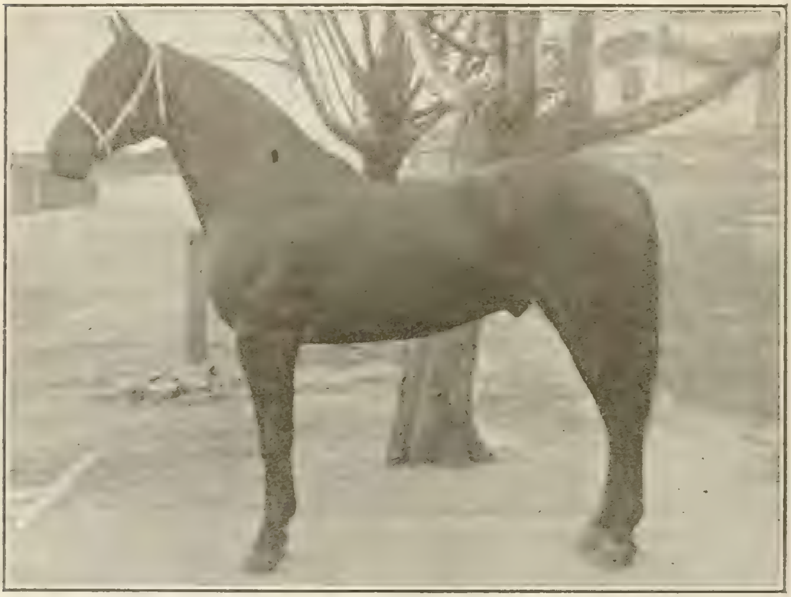
Characteristics.—The German Coach horses are usually solid black, brown, bay, chestnut or sorrel in color; stand 16 to 16¾ hands high and weight 1350 to 1550 pounds. They are noted for early maturity and the best types are symmetrical in build, up-standing, high and graceful in action and in carriage of head, neck and tail; strong, well-sprung and short-coupled in body, and on strong-boned, clean legs. The bones of the German coach horse are somewhat larger than those of the French coach horse and frequently incline to coarseness under the knees. The action of the two breeds is similar. The German coacher is usually the heavier and stronger of the two breeds.

Utility.—Mated with large, strong, sound mares the best of the German coach horses will be likely to beget a fair proportion of useful coach horses and a large number of useful wagon horses, light expressers and general purpose animals. The stallions of medium size, smoothness of conformation, graceful carriage and action and showing no objectionable coarseness in bone or general make-up should be preferred to the larger and coarser sorts.

CHAMPION GERMAN COACH STALLION WARNER.

THE CLEVELAND BAY.

In early days the Cleveland district in England was noted for a distinct breed of horses celebrated for long distance driving and coach work. The breed was bay in color and formed by crossing the thoroughbred upon the native mares of this district. When coaching practically ceased, on the introduction of railroad, the Cleveland Bay breed became less common and in 1884, when the stud bock was formed, had almost become extinct. The ancient type of Cleveland horse was adapted for drawing heavy loads at a fair rate of speed. Additional speed and lighter frame were brought about by using the thoroughbred. Since the formation of the stud book an attempt has been made to re-build the breed upon the scant foundation stock remaining in its original habitat, but of recent years comparatively few of these horses have been brought to this country.



CLEVELAND BAY STALLION.

The Yorkshire Coach also originated in England, is of similar type, but is less true to type, often has white markings and shows more recent crossing with the thoroughbred. These horses have been less used with us than the Cleveland Bay and now are seldom heard of in America.

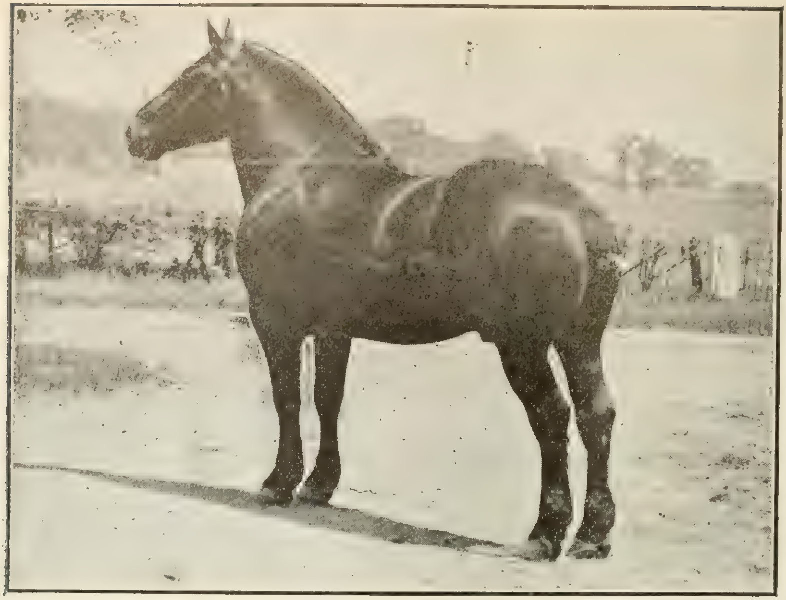
Characteristics.—The modern Cleveland Bay is of rangy build, standing 16 hands high, weighs 1300 to 1500 pounds, is bay in color, with black points. The typical horse of the breed is, as a rule, a powerful animal, with coach horse conformation, short back, strong thighs, and quarters, and the straight croup of the thoroughbred. Many of them incline to coarseness and, as a breed, most of its representatives lack prepotency to produce quality, so that they have not become widely popular among our breeders.

Utility.—The Cleveland Bay stallion of the best type and breeding stamps his color, markings and good disposition upon his progeny and, when crossed with common mares, begets a fair proportion of light, active horses for general purpose work.

THE PERCHERON.

This breed takes its name from the district of La Perche in France, which is now the chief draft horse-breeding and handling center in that country. The breed originally derived its size and weight from the ancient Black horse breed of Flanders and its style and quality from sires of the Oriental breeds, notably from the grey Arab stallions, Godolphin and Gallipoli. In the early days the breed was used for coach and bus work, and was of suitable type and conformation for that purpose. More recenty weight and larger bone have been developed by use of heavy draft stallions of one or other of several breeds of the sort to be found in France. Grey was the original color of the breed, but, recently, black has become as common, although it is not so surely transmitted as the characteristic grey of the purer bred Percherons. Until 1883 draft horses from France went by various names, such as French draft, Norman, Norman-Percheron, Percheron-Norman, and Percheron, but in the year mentioned the Percheron Horse Society of France was organized and the name Percheron adopted for the breed. The first volume of the Percheron-Norman Stud Book of America was published 1876, but the name Percheron was finally adopted as a result of similar action in France. French Draft horses, also from France, and practically of the same breeding as the Percheron, have a separate stud book, entry to which is based upon rules less stringent than those adopted by the Percheron Association. After prolonged dispute, matters pertaining to the registry of Percheron horses in America, have at last been satisfactorily adjusted, a stud book will appear in the near future and proper supervision of pedigree confidently is to be expected, under the new management.

Characteristics.—The modern Percheron stands 16 hands high and over, weighs from 1700 to 2200 pounds, and is white, grey or black in color. He has an intelligent head, of a type peculiar to the breed; rather small ears and eyes; short, strongly muscled neck; strong, well-laid shoulders and chest; a plump, rotund body; strong back, heavy quarters, and somewhat drooping croup. He usually is low down and blocky, on short, clean legs, devoid of feather, and has well shaped, sound hoofs. The pasterns in some individuals of the breed incline to uprightness and size of bone and development of tendon are somewhat deficient. The action of the Percheron is usually fast at a trot, and fairly straight and sprightly at the walk. The best individuals have superior all-round action. The objectionable specimens roll in action of forelegs, go wide behind or slouch at the walking gait. Stallions having oblique pasterns and action free from the faults noted should be selected by breeders.



CHAMPION IMP. PERCHERON STALLION PINK.

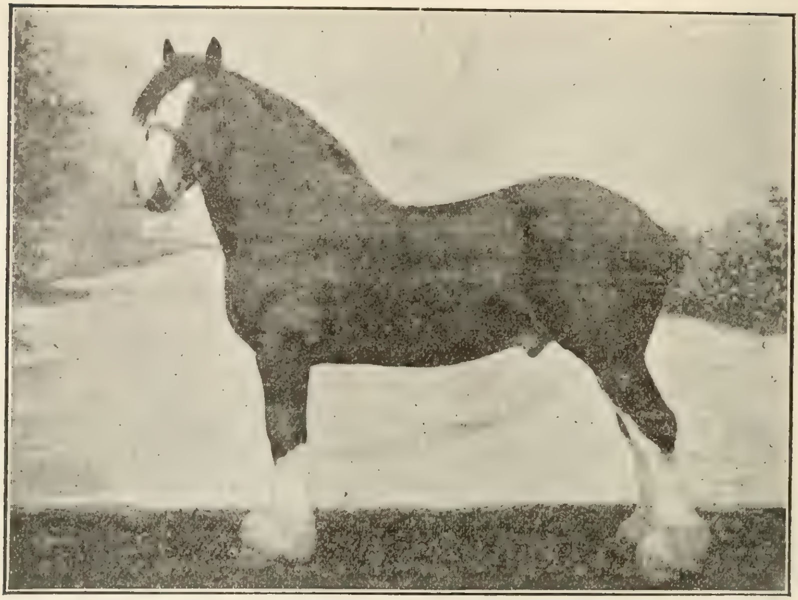
GROUP PURE-BRED PERCHERON MARES.
Property of Wisconsin College of Agriculture.

Utility.—The draft horses of France, more than those of any other countries, have had a beneficial, ameliorating effect upon our native horse stock. The Percheron breeds true to breed type, although individual prepotence is somewhat lacking. He has become popular because of his docile disposition, easy keeping qualities, clean hairless legs, activity, and general adaptibility for many purposes upon the farm and in the city. Percherons of the heaviest weight and largest frame beget, from suitable mares, horses adapted for heavy draft purposes. In general use he has also stocked the country with horses of somewhat lighter build, including excellent expressers, farm chunks, and general purpose animals. Where the blood of this breed predominates in a district, no other breed should be used. Contined breeding in a right line is highly advisable and will result in the production of practically pure-bred horses of great usefulness and value.

THE CLYDESDALE.

This is the draft horse breed of Scotland and there has been bred pure for many generations. It originated in the upper ward of the County of Lanark, commonly called the Clydesdale district, and at the present time is well disseminated throughout the country, while certain counties, notably those of the southwest, successfully rival the home county of the breed in the production of high class animals. Heavy black Flemish stallions, as with all other heavy draft breeds, were freely used to found the Clydesdale, and indsiputable records show that such horses were employed as early as 1715. Ever since then great attention has been paid to the improvement of the breed and the preservation of purity of blood and records of pedigree. The Clydesdale district has been proved peculiarly adapted for the production of draft horses characterized by exceptional quality of bone, muscle, tendon and hair, while hardihood, activity, vim, vigor, and endurance have been the natural heritage of the environment. Color has been given much attention, so that bay, or brown, with white markings now predominate, while other colors, such as grey, chestnut, and black, are less commonly met with. So carefully have these horses been mated and so honestly have all matters pertaining to pedigree been conducted, that the purity of blood of recorded horses of the breed is beyond question and assures a high degree of not only breed prepotency, but remarkable individual prepotency, enabling the Clydesdale to transmit with certainty his characteristics of color, size, quality, temperament, conformation and action. Clydesdales were imported into Canada as early as 1842 and ever since have successfully held the field against all rivals, until this blood today permeates the entire draft stock of that country. The breed was introduced in America somewhat later but importations did not become common until 1880-81. In 1877 the Clydesdale Society of Great Britain and Ireland was founded and a stud book issued. The Clydesdale Society of America also was organized in 1877 and the first volume of its stud book appeared in 1882.

Characteristics.—The typical Clydesdale stands 16 hands high and over, weighs from 1800 to 2200 pounds, and is bay, brown, black or



IMP. CLYDESDALE STALLION CRITERION.
Owned by Hon W. L. Houser, Secy of State, Mondiva, Wis.

GROUP OF PURE-BRED CLYDESDALE MARES.
Property of Wisconsin College of Agriculture.

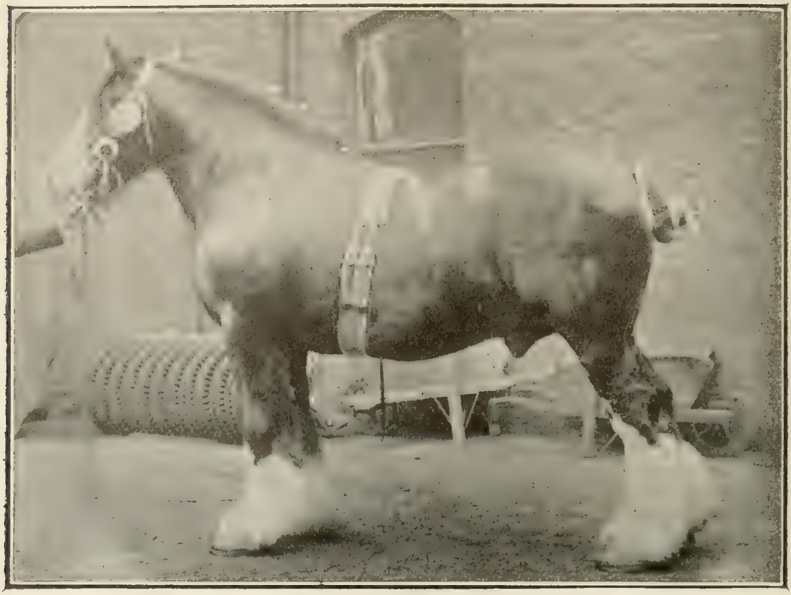
chestnut, with white markings. The head usually is of good shape; eyes practically perfect; ears of correct shape and size; neck of fair length, arched and muscular; shoulders sloping so as to insure, along with oblique pasterns of model type, long, free, sprightly, springy action at the walk and trot; body powerful; back fairly good, in some horses of the breed too shallow and long in coupling; croup of ideal type and well muscled; thighs and quarters strong and full of muscle; legs free from meatiness and notable for breadth, development of tendon, clean, dense bone and quality of fine, silky hair ("feather") which springs from the rear of the back tendons and is conceded to be an indication of quality in the underlying tissues. Special attention has for many years been given by breeders to developing quality and action in their horses, with the result that the Clydesdale is uniformly excellent in the former particular and noted throughout the world for his fast, elastic, energetic walking and trotting gait. A fast walking pace is the chief requisite as regards the action of a heavy draft horse and this has always been a marked characteristic of this breed, while improvement is also noticeable of late years in the hoofs, which were often somewhat flat, shallow, and low at the heels, and in the body, which was criticised as somewhat light and lacking in depth.

Utility.—Next to the draft horses of France, Clydesdales have been imported to this country in the largest numbers and have been most effective in improving our native stock towards draft type. Their utility is dependent upon the combination of weight, quality and activity, and they may everywhere successfully be used for grading-up purposes to produce the best quality of heavy draft horses for work on the farm, in the city, and in the pineries.

THE ENGLISH SHIRE.

The heavy black stallions of Flanders, used upon the native mares of the Fen counties of England, founded this breed of ponderous, hairy legged draft horses many centuries ago and it still is bred pure and gradually has been improved in many particulars. The black color is no longer characteristic of the breed. Its representatives now are mostly bay or brown and they are less coarse and sluggish than was formerly the case. They long have been extensively bred in Leicestershire, Staffordshire, Derbyshire, Oxfordshire, Lancashire, Yorkshire, Cheshire, Nottingham, Northampton, Lincolnshire and Cambridgeshire. The last two counties are most extensively engaged in Shire horse breeding. Many Shires of very poor quality were imported into the United States in the early days of the business; later on better quality characterized the importations; of recent years comparatively few Shires have been imported. The first volume of the stud book of the Shire Horse Society of England was published in 1880, and that of the American Shire Horse Association appeared a few years later.

Characteristics.—The typical Shire horse is of great weight and power. He is more massive than the Clydesdale but lacks the quality of the latter breed. His body is short, deep, broad, round, the coupling extra strong and close and the thighs and quarters heavily muscled.



CHAMPION ENGLISH SHIRE STALLION STROXTON TOM.

PRIZE WINNING ENGLISH SHIRE MARE HENDRIE CROWN PRINCESS.

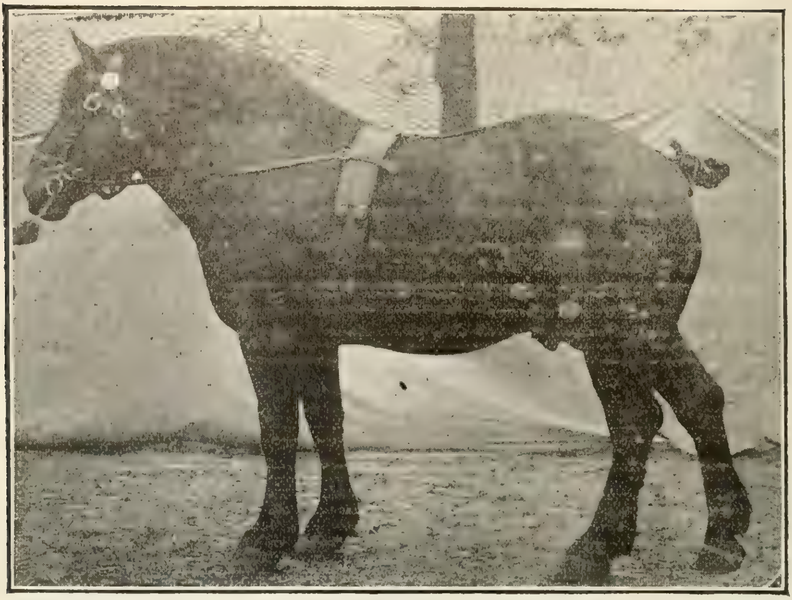
While immensely powerful he is slow in motion and sluggish in disposition. His hair is somewhat coarse and the legs while extra heavy in bone do not present the clean appearance of those of the Clydesdale. The shoulders and pasterns are more upright than those of the Scottish breed and the action is consequently slow and stilted. The strong, broad short back of the Shire should serve as a pattern for other breeds, and the best specimens of the breed, free from gumminess of legs and possessed of activity, can be utilized with good results if mated with our mares of large frame. The Shire is essentially a "ton horse," many specimens even exceeding that weight.

Utility.—A cross between the Shire and Clyde results in first class horses for heavy draft work but such cross-bred animals should not be utilized in breeding. The so-called "Select Clydesdale" is of this breeding but is little heard of now-a-days and the stud book for their registration is defunct. For heavy, slow draft work Shire horses everywhere are valuable and the breed is prepotent in the production of its characteristics.

THE BELGIAN DRAFT HORSE.

From blending together the blood of the Flemish Brabancon and Ardennais horses a distinct breed of draft horses has been formed in Belgium. The breeding of these horses constitutes one of the principle sources of wealth of the Belgian farmer and the government aids the business by subsidies and supervision. The Belgian Draft Horse Society was founded in Belgium in 1883 and now has a membership of 1,100. Vol. II of the Stud Book shows 25,260 registrations of stallions and 43-533 registrations of mares. All stallions standing for public service are examined yearly by expert committees. Imported Belgian horses should have pedigree certificates signed by the Secretary of the "Societe Le Cheval de Trait Belge," for, according to the Special Commissioner of Agriculture of Belgium who was in charge of the exhibit of Belgian horses made by the Belgian Draft Horse Society at the St. Louis World's Fair, "The use of false pedigrees is constant, in fact they are the subject of definite commerce. Letters of nobility are given to the plebians and with the aid of false certificates, horses untraced are brought to market as the offspring of champions and prize-winners in our shows."

Characteristics.—The typical Belgian horse is blocky, wide, heavy, on short, clean legs. His neck often inclines to coarseness and his croup is sloping while his pasterns are apt to be upright and his feet somewhat steep. The old-fashioned type was a soft, unattractive, fat horse of little value for mating with our native mares. The newer pattern is a better one, its representatives being fast, free movers and greatly improved in the points just criticised. As a rule these Belgian horses are perhaps more readily and quickly fattened than those of any other breed. This attribut makes the Belgian grade popular with the professional horse feeder and of recent years many horses of this kind have been sold to advantage in the Chicago market. There seems to be no standard color for the breed. Red and blue roans are most common while bays and browns are also met with.



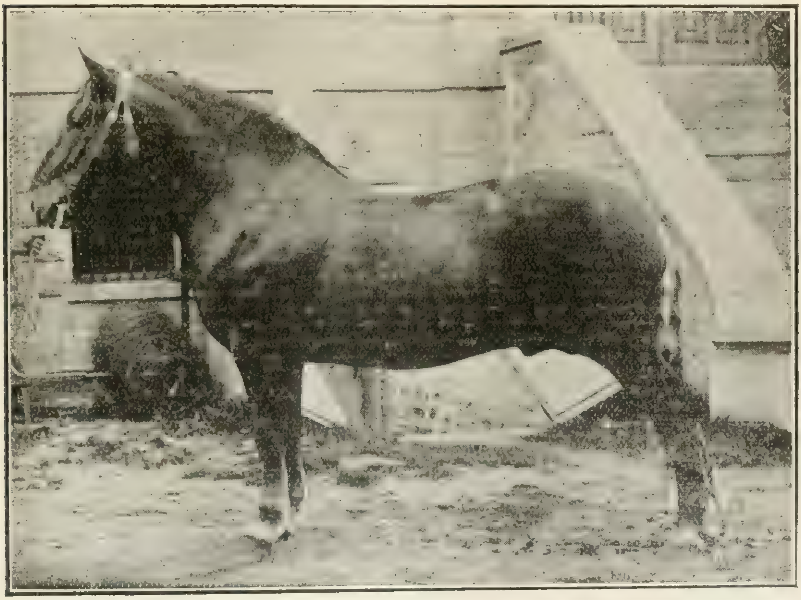
BELGIAN DRAFT STALLION.

BELGIAN DRAFT MARES.

Utility.—Belgian horses have of recent years been strong rivals of the other breeds and the newer type referred to is giving good results among our breeders who, as stated, appreciate the easy feeding qualities of these horses. There is a good deal of similarity between the Belgian and the Suffolk breeds but the former has become most popular throughout the country.

THE SUFFOLK-PUNCH.

This draft breed takes its name from the county of Suffolk in England where it has been bred for at least 200 years after the present type and color. Suffolks are uniformly of chestnut or sorrel color, less in size than the Shire, or Clydesdale, somewhat sluggish in disposition, very easy keepers, long in body and on short, rather light-boned legs. Comparatively few of these horses have been imported to this country and while useful in their own country they have not become popular here or in Canada. Archibald McNeilage* says of the Suffolk horse: "If purity of breeding and distinctness of type would alone make a breed valuable, he ought to-day to be the most valuable draft horse in the world. Instead of that, of British breeds he is the least valuable, nor do I know of any instance in which he has been successfully used as one side in producing a cross-bred. For a dead pull in the collar, the Suffolk-Punch has a proverbial reputation. As far as I



IMP. SUFFOLK STALLION RENDLESHAM STANDARD-BEARER.

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*Secretary of the Clydesdale Horse Society of Great Britain and Ireland.

know, he deserves it. The chief objections to the Suffolk is the disparity between the weight of his body and the lightness of his limbs. He exhibits also a formation of hock which suggects a disposition to curb. For working heavy clay soil, such as prevails in East Anglia, his home, the Suffolk is invaluable. There he is seen at his best, and as long as these heavy clays are cultivated his position as an agricultural horse is not likely to be assailed."

MARKETING HORSES.

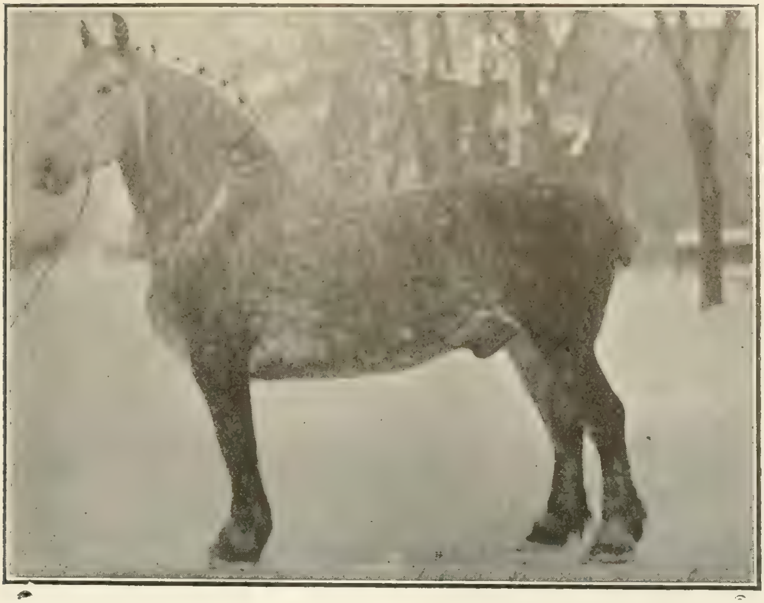
To sell promptly at a remunerative price a horse should be of a recognized market type. Horses are classified when they arrive at great markets like that of Chicago and according to the demand for the certain class to which a horse clearly belongs and his individual excellence, according to the requirements of that class, will largely depend the price paid for him.

On general principles, apart from the consideration of class requirements, every horse forwarded to market should be in good condition from full feeding. Extra condition, especially in heavy draft horses, is estimated to be worth twenty-five cents a pound in the Chicago market. For immediate purposes of work a horse should at least be five years old, well-matured and well-broken. Immature horses, under five years of age, do not stand work well upon the city pavements, hence are likely to sell at a depreciated price. There is, however, a good and growing demand for well-bred, well-formed, strongly-developed, sound, active, heavy draft geldings under five years in age to be fattened for market by men who make a specialty of that business. Such horses are classed as "Feeders" in the market.

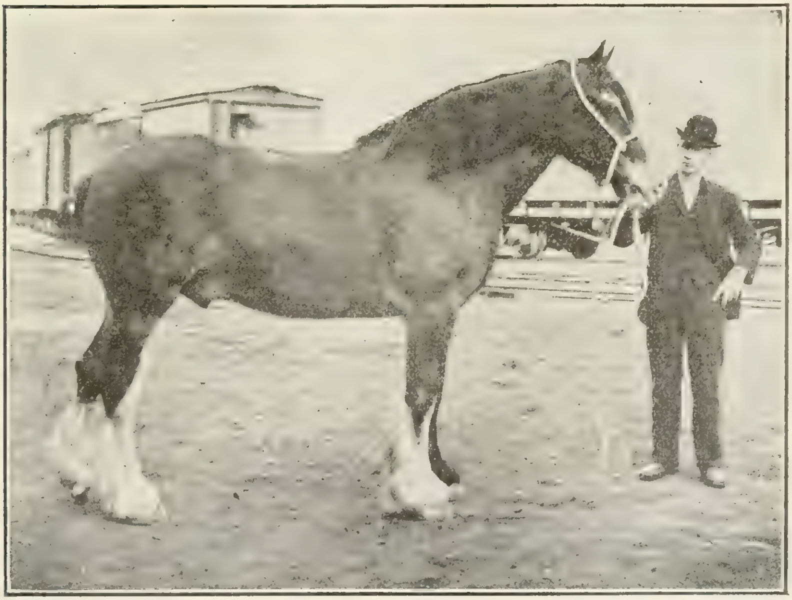
It has well been said that "a good horse is a good color" but there is some discrimination against "washy" colors, pink noses, "flea-bitten" grey, white and "mealy" bay horses. A solid grey color, in horses of "French blood" will out-sell black by $50, or over that figure in some instances. Carriage teams sell best when matched as regards color as well as other requisite points.

Horses offered for sale should be well-groomed, but fore-tops, manes and tails should be left intact. A clipped or "roached" horse is likely to be regarded as "second hand" in any large horse market. Vice injures the value of the horse so afflicted and any serious defect or unsoundness speedily will be detected and have the same affect. It especially is desirable that the feet of all horses should be properly cared for so that at marketable age the horse may appear to the best possible advantage. Horses notably unsound as regards wind, limbs or feet should not be forwarded to market. They will surely prove an expense to the shipper. The average life of a sound horse used steadily upon the streets of a city is five years; the unsound, or weak-footed horse wears out in considerably less time.

City horse dealers and commission men are excellent judges of horseflesh as are most of the professional buyers to whom they sell country horses. Good points instantly are noted and estimated at their proper value. Departures from sound or desirable conformation, quality,



CHAMPION PERCHERON GELDING GEORGE.
Photo from owners, Pabst Brewing Co., Milwaukee, Wis.



IMP. CHAMPION CLYDESDALE GELDING MALCOLM.
Photo from owners, Nelson, Morris & Co., Chicago,

action, condition or temperament as surely diminish the value of a horse in the market. Breeders, therefore, should carefully study what has been set down elsewhere in this bulletin relative to conformation of light and draft horses and learn to avoid defects that depreciate the market prices of horses.

Blemishes such as unsightly barb-wire wound scars, mutilated ears, lips or nostrils should be avoided so far as possible and to this end barb-wire fences should be done away with on every farm where horses are bred and reared.

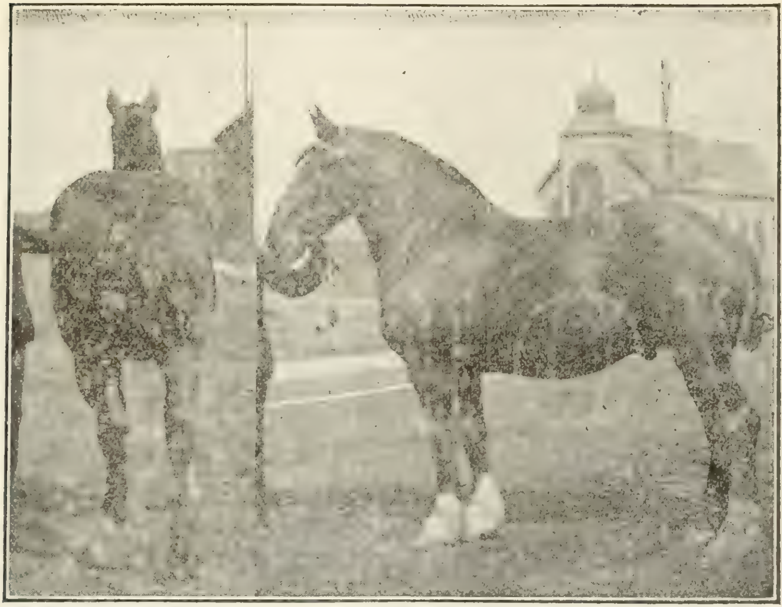
MARKET CLASSES.

The Draft Horse.—A typical draft horse, so considered in the market, should stand 16 hands or over. Horses much over 17.2 hands in height are not popular. Exceptionally tall horses of plain conformation and lack of quality that cannot easily be matched sell at very low prices, but if excellent in every particular sell correspondingly high. Light draft horses range in height from 15.3 to 16.1 hands. Drafters should weigh 1,600 pounds and over in fair condition and heavy weight in addition to desirable conformation, soundness and action enhances value. Vigor and free, correct action, especially at the walking gait, should be present in even the heaviest draft horses. Draft geldings of the finest type, action, quality, weight and power are comparatively scarce and always in demand. In the Chicago market during 1904 drafters of the latter class were sold for very high prices. A 2,210 pound roan Shire-cross gelding brought $660. The Pabst Brewing Company paid from $350 to $500 per head for grey Percheron grade geldings weighing from 1,900 to 2,100 pounds. Three draft teams weighing from 4,190 to 4,480 pounds and apparently of British draft horse blood sold for $1,000 per team while Nelson Morris & Co. paid as high as $1,000 per head for some of the Clydesdale geldings of their show teams. The average price for drafters in the Chicago market during 1904 was $177 per head.

Loggers.—Horses of this class are heavy drafters possessed of weight, great power and strength of bone but blemished or slightly unsound so that they cannot be sold to advantage for use in the cities. They should be of docile, "level-headed" disposition, true workers, and of hardy constitution as they are intended for hard, rough, racking work, coarse diet and imperfect shelter. They should be sound in wind and have good middles, large, sound, powerful joints, tendons and muscles and healthy coats of hair. Horses of this sort, the best draft horse product of Wisconsin, are largely bought by our lumbermen for us in the woods which partly explains the fact that our drafters are not better known in the great horse markets. For the purpose mentioned our lumbermen greatly prefer the sound, hardy, home-produced "logger" to the overfed, blubbery horse of the dealer. Loggers sell in Chicago at from $160 to $250 per head.

Farm Chunks.—While not especially desired, many horses of this kind find their way to the large markets and are sold at from $100 to $175 a head. They usually are of mixed draft blood, stand from 15 hands up and weigh from 1,100 to 1,500 pounds. They are the heaviest of the lighter draft type of misfits and mongrels elsewhere referred to, but among their numbers are found many animals useful for sundry purposes.

General Purpose Horses.—These animals are not recognized as a standard market class but form a large proportion of the entire number of horses marketed annually. They are nondescript in character, of all possible blends of blood and consequent lack of type. They usually are serviceably sound and often of fair to good quality but they lack the characteristics fitting a horse for a distinct market class. They are bought for all sorts of purposes and at comparatively low prices according to individual character. The average price for such horses in the Chicago market was $140 during 1904.

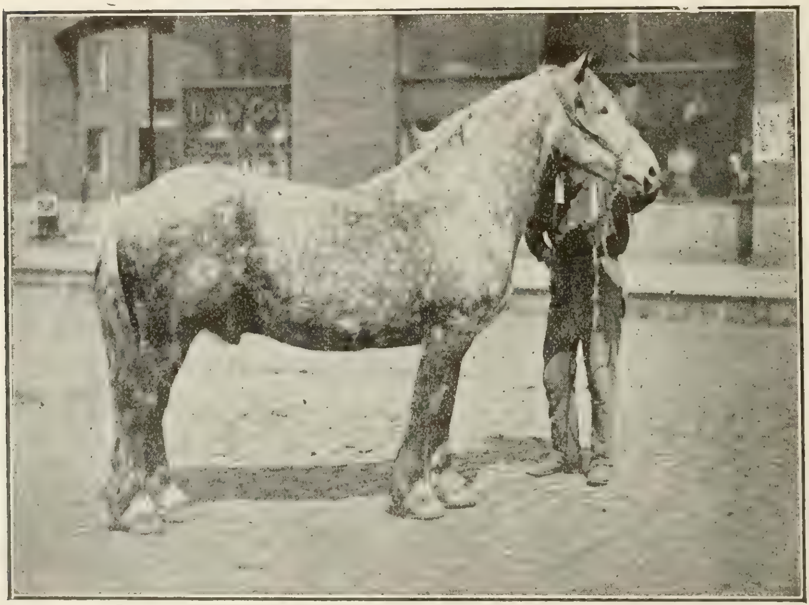


TYPICAL HEAVY DRAFT TYPE.

Expressers.—These are individually excellent, active, light draft horses that are expected to do most of their work at a trot. The demand for them is active at all times and the best of them command high prices. The typical expresser stands 15.2 to 16 hands and weighs 1,350 to 1,500 pounds or over according to the class of work to be done. They should be upstanding but not "leggy," clean legged, graceful, active, sound, hardy, sensible horses possessed of sufficient power to move comparatively heavy loads at a brisk walk or trot. Sound "wind" is imperative and legs and feet should be of the best possible quality. They are commonly considered "draft horses with coach horse finish." They command $20 to $25 more than farm chunks in the market.

Bussers.—Horses of this class stand from 15.1 to 15. 3 hands and weigh from 1,200 to 1,400 pounds. They are small, compact low down blocky horses of draft conformation with strong bone and sound feet. Like the expresser their chief work is done at the trotting gait, hence they must be active, energetic, straight and somewhat stylish in carriage and gait. Many of them go abroad to serve as "trammers" but there is use for numbers of them in the large cities and elsewhere. They sold for an average of $140 a head in the Chicago market during 1904.

Artillery Horses.—In this class geldings are required and they should be uniform, hardy color, in good condition, from 15 1-4 to 16 hands high, quick and strong in action, sound, without blemish or defect, well bred, of a kind disposition, free from vicious habits, square trotters, well broken to harness, gentle under saddle, with easy mouths and gait. They should weigh from 1,100 to 1,250 pounds and be from 5 to 8 years old. The cavalry horse is much the same type.

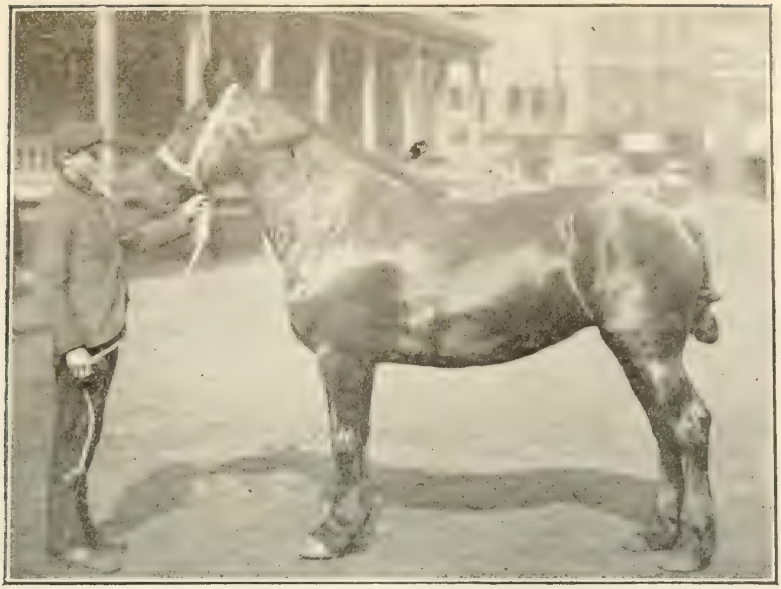


BREWERY HORSE.

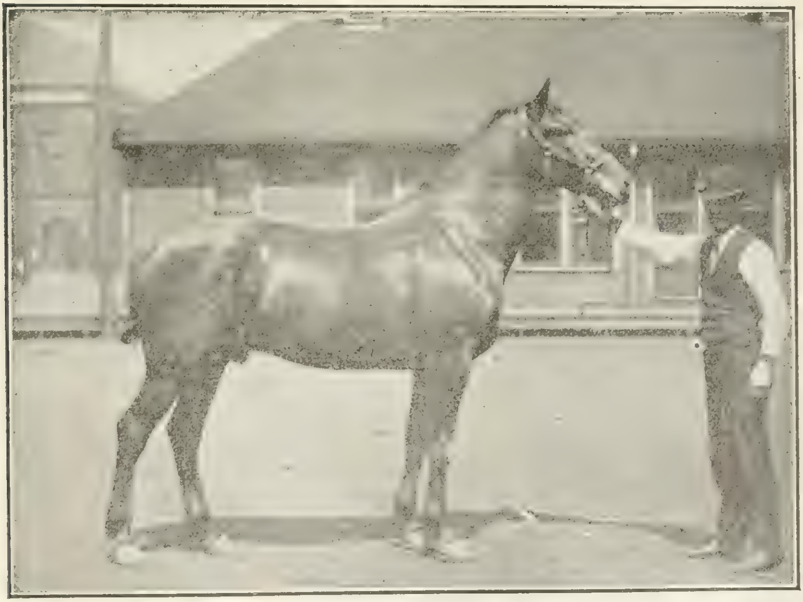
Photos from Union Stock Yard Co.

Drivers.—The typical roadster should stand from 15.1 to 15.3 hands high and weigh from 950 to 1-150 pounds. His purpose is to draw a light buggy on the road at a fairly rapid rate of speed for a considerable length of time. He should be graceful in form, action sprightly, pleasing, straight and smooth at all gaits, his disposition good and his legs and feet sound. His price depends upon individual quality but averaged $150 in the Chicago market during 1904.

Standard-Bred.—This class includes trotters and pacers eligible to record in the trotting register and possessed of notable speed and the



FARM CHUNK.



MODEL EXPRESS HORSE.

Photos from Union Stock Yard Co.

breed prepotency in that direction. Farmers and breeders are generally familiar with this type so that it need not be described in detail.

Coachers.—A typical coach horse stands 15.2 to 16 hands and weighs 1,100 to 1,250 pounds. He should have high knee action and correspondingly high hock action that comes from breeding rather than artificial methods of development. He is not required to have great speed or marked powers of endurance but must move fairly fast with much gracefulness of carriage, possess fine kuality, be beautiful in all his curves, and carry his head and tail high. While heavier, smoother and compact than the roadster he must be showy and stylish to carry fine harness and draw handsome equipages. It is particularly desirable that in high knee action his feet should practically follow the circumference of a circle without pause or thrusting forward as they approach the ground. The entire make-up of the coacher should be eminently refined and aristocratic, and very high prices are paid in the market for animals that come up to these requirements. Carriage teams, practically unbroken, averaged $475 in the Chicago market during 1904.

TYPICAL FIRE DEPARTMENT HORSE OR LARGE DRIVER.

Wagon Horses.—For parcel delivery service the great department stores of Chicago and other cities use numbers of "wagon horses." These are big, overgrown coachers, stand 16.1 hands, weigh 1,250 pounds and sell for almost as much as true coach horses. The demand for horses of this type is keen at all seasons of the year.

Cobs.—A typical cob stands about 15.1, weighs from 1,000 to 1,050 pounds, is more compact and blocky than a coacher, yet must have style and beauty in a marked degree. His action should be extremely high and "trappy." Sensational prices have been paid for such horses.

Saddlers.—These horses vary considerably in type, size and weight but as a rule are from 15.1 to 15.3 hands high and from 1,000 to 1,150 pounds in weight. They should have great style and quality, smooth conformation, natural and thoroughly trained saddle gaits, inteligent, clean-cut countenances, sloping pasterns and shoulders, moderately high and narrow withers, short, strong coupled backs, strong and mascular thighs, and well-carried heads and tails. The American saddle horse has been highly developed and possesses great intelligence, quality, grace, style, ease and freedom of motion with breed prepotency to reproduce these desirable qualities. "Walk, trot and canter" saddlers have become popular of recent years and sell at high prices. They may be bred from such trotting horse stock as is plentiful in Wisconsin.

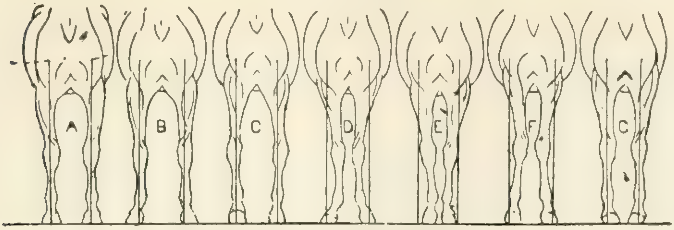
TYPICAL U. S. CAVALRY HORSE

Photos from Union Stock Yard Co.

PAIR OF FINE COACH HORSES.

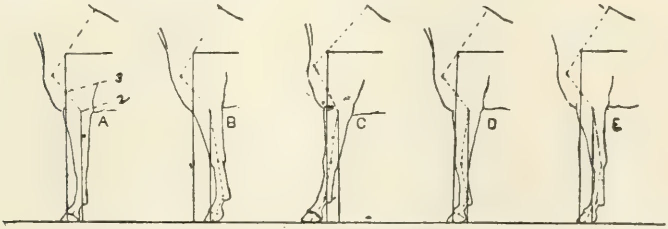
Photos from Sanders Pub. Co.

Rules Governing Position of the Limbs of the Horse When Standing.



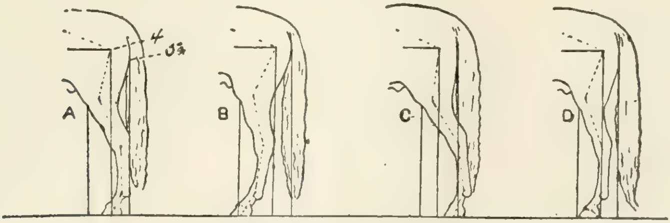
FRONT VIEW OF FORE LIMBS

A vertical line downward from the point of the shoulder should fall upon the center of the knee, cannon, pastern and foot. Cut A of Plate I represents the right conformation. B, C, D, E, F and C represent common defects.



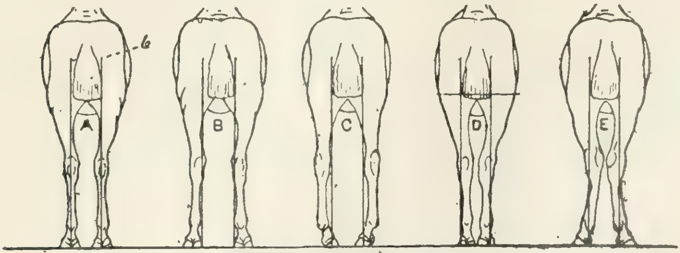
SIDE VIEW OF FORE LIMBS.

A vertical line drawn downward from the center of the elbow joint should fall upon the center of the knee and pastern joints and back of the foot, and a vertical line drawn downward from the middle of the arm should fall upon the center of the foot. Cut A of Plate II represents the right conformation. B, shows the foot placed too far back; C too far forward D, "knee sprung" and E, "knock kneed."



SIDE VIEW OF HIND LIMBS.

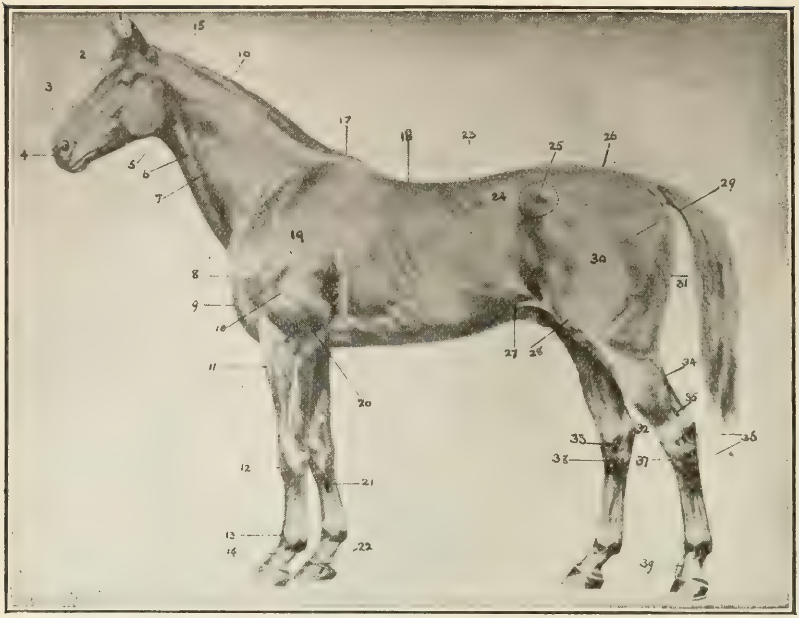
A vertical line drawn downward from the hip joint should fall upon the center of the foot and divide the gaskin in the middle, and a vertical line drawn from the point of the buttock should coincide with the angle of the hock and pastern joints. Cut A of Plate III represents right conformation. B, C and D represent common defects.



REAR VIEW OF HIND LIMBS.

A vertical line drawn downward from the point of the buttock should fall upon the center of the hock, cannon, pastern and foot. Cut A of Plate IV represents conformation. B, C, D and E represent common defects.

From "Judging Live Stock," by Prof. Jno. A. Craig.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KEY TO CHART OF HORSE.

1. Poll. Seat of "poll evil."
2. Forehead.
3. Face.
4. Muzzle.
5. Throat-latch.
6. Windpipe.
7. Jugular groove.
8. Point of shoulder.
9. Chest.
10. Arm, from shoulder point to elbow.
11. Forearm.
12. Knee.
13. Fetlock.
14. Pastern.
15. Neck.
16. Crest.
17. Withers.
18. Back.
19. Shoulder.
20. Elbow.
21. Seat of splint.
22. Seat of sidebone. Quarter-crack indicated below.
23. Loins.
24. Coupling.
25. Hip.
26. Croup.
27. Flank.
28. Stifle.
29. Hip joint.
30. Thigh.
31. Quarter.
32. Point of hock.
33. Hock joint.
34. Gaskin or lower thigh.
35. Seat of thoro' pin.
36. Seat of curb.
37. Seat of bog spavin.
38. Bone spavin.
39. Seat of ringbone.

SCORE CARD—DRAFT HORSES.

Scale of Points.	Possible score.	Points Deficient.	
		Students Score.	Corrected.
Age			
GENERAL APPEARANCE—29 POINTS			
Height, estimated hands; actual			
Weight, over 1,600 lbs; estimated lbs; score according to age	6		
Form, broad, massive, evenly proportioned, symmettrical, blocky	4		
Quality, refined; bone clean, large, strong; tendons clean, defined, prominent; skin and hair, fine; feather if present, silky	6		
Action, walk: fast, elastic, regular, straight; trot: free, springy, balanced, straight	10		
Temperament, energetic; disposition, good	3		
HEAD AND NECK—8 POINTS			
Head, proportionate size, clean cut, well carried; profile straight	1		
Muzzle, neat; nostrils large, flexible; lips thin, even, firm	1		
Eyes, bright, clear, full, same color	1		
Forehead, broad, full	1		
Ears, medium size, well carried, alert	1		
Lower Jaw, angles wide, space clean	1		
Neck, muscled, arched; throat-latch, fine; windpipe large	2		
FOREQUARTERS—22 POINTS			
Shoulder, moderately sloping, smooth, snug, extending into back	3		
Arm, short, strong muscled, thrown back, well set	1		
Forearm, long, wide, clean, heavily muscled	2		
Knees, straight, wide, deep, strong, clean	2		
Cannons, short, wide, clean; tendons clean, defined, prominent	2		
Fetlocks. wide, straight, strong, clean	1		
Pasterns, moderately sloping, strong, clean	3		
Feet, large, even size; sound; horn dense, waxy; soles concave; bars strong, full; frogs large, elastic; heels wide, one half length of toe, vertical to ground	8		
BODY—9 POINTS			
Chest, deep, wide; breast bone low; girth, large	2		
Ribs, deep, well sprung, closely ribbed to hip	2		
Back, broad, short, strong, muscular	2		
Loins, short, wide, thick muscled	2		
Underline, low, flanks full	1		
HINDQUARTERS—32 POINTS			
Hips, broad, smooth, level, well muscled	2		
Croup, wide, heavily muscled, not markedly drooping	2		
Thighs, deep, broad, strong, muscular	3		
Quarters, plump with muscle, deep	2		
Stifles, large, strong, muscular, clean	2		
Gaskins, (lower thighs) long, wide, clean, heavily muscled	2		
Hocks, large, strong, wide, deep, clean, well set	8		
Cannons, short, wide, clean; tendons clean, defined, prominent	2		
Fetlocks, wide, straight, strong, clean	1		
Pasterns, moderately sloping, strong, clean	2		
Feet, large, even size, sound; horn dense, waxy; soles concave; bars strong, full; frogs large, elastic; heels wide, one-half length of toe, vertical to ground	6		
Total	100		

Animal .... *Date* ....

Student .... *Standing* ....

POINTS OF THE DRAFT HORSE.

Height.—A typical draft horse should stand sixteen hands high or somewhat over that height. Extra tall, leggy drafters, deficient in weight, width and quality are unliked in the market and many of them are prone to chorea (St. Vitus' Dance). Abnormally tall horses, unless wonderfully good in conformation so that the height is not ungainly, are difficult to match and therefore not in demand in the market. Such horses for single work or as the middle horse of a three-horse team for hauling coal, etc.

Weight.—A draft horse should weigh sixteen hundred pounds and upward. Weight is absolutely necessary for the hauling of heavy loads. It enables the horse to derive full benefit from the strength of his muscles and tendons, adds to the effect of his levers in motion, and gives him a firm grip upon the ground. It is a burden and practically useless when not associated with perfectly developed, exercised muscles, so far as actual work is concerned, but is requisite in every draft horse offered upon the market if he is to command a high price. Where the frame shows adaptability, in a thin horse,to put on flesh he is bought by the professional feeder who finishes him for the market. In a well developed draft horse extra condition is considered worth twenty-five cents per pound in the Chicago market. For practical purposes the great weight of a draft horse should be made up of large, strong bones and powerful muscles throughout the frame. Fat should be discounted in buying a draft horse for work and, in judging, one should note development of muscle rather than wealth of flesh and fat. A typical draft horse should still weigh sixteen hundred pounds or over when deprived of the condition referred to.

Form.—The entire make-up of the draft horse should suggest strength for heavy hauling. He should be broad, deep, thick, round, with each part in keeping with it neighboring parts, giving an appearance of symmetry and massiveness. He should be low-down, blocky and compact, on short, strong-boned, clean legs showing marked prominence and development of tendons and the legs should be properly placed and set to insure corect, straight action at the walk or trot.

Quality.—This term applies to evident refinement in character of skin, muscles, bone, tendons and hair. It infers also aristocratic breeding and all of the attributes of pure blood. It is indicated by high spirits, vigor, sprightly action, endurance, stamnia and intelligence and is plainly indicated when the legs are free from meatiness, appear broad, flat, "clefty" and, if furnished with "feather," the hair under knees and hocks springs as a silky fringe from the rear of the tendons. Quality offsets grossness and combines grace with great weight and power in the best types of draft horses.

Action.—A draft horse will have to do most of his hard work at the walking gait. It is therefore of supreme importance that he should be able to walk fast without tiring and in order to do this his action must be perfectly straight and level. The joints must be easily and fully flexed, the feet must advance and be set down without deviations from a straight line. The soles of the feet should turn up and show plainly to the judge as the horse goes from him, at both walk and trot. The feet should be lifted quickly, fully and rythmically and set down squarely and firmly. There should be no paddling, dishing, cutting or interfering; nor should the fore legs roll or the hind legs be carried too close together or too far apart. In judging of action note the movements of each leg and foot, the handling if each joint and the carriage of the entire body as the horse walks and trots around an enclosure, from the observer and to him. Lameness should be absent. The hocks should be carried well together. Rolling in front in due to too great width of chest. Stubby stilty action in front indicates straight or too upright pasterns or shoulders, foot troubles or weak knees. Similar action of the hind legs indicates upright pasterns, unsound feet, hock disease, weak stifles, hip weakness or kidney troubles. Knee and hock action should both be free and comparatively high.

Temperament.—A draft horse should have an energetic disposition but should be free from vice, docile tractable and intelligent. Sluggishness, associated with obesity is objectionable and induces diseases such as "grease," eczema, and "lymphangitis."

Head.—The head should be of good size in keeping with the proportions of the body, free from grossness, meatiness, coarseness, pronounced angularities.

Muzzle.—Should be fine, compact, of good quality as regards skin and hair, nostrils large and flexible and their lining and that of the partition between the nostrils (septum nasi) pink in color, healthy, free from ulcers or purple spots; discharge should be absent; bad odor suggests chronic catarrh or a diseased molar tooth; lips should be thin, mobile but firmly pursed, not drooping.

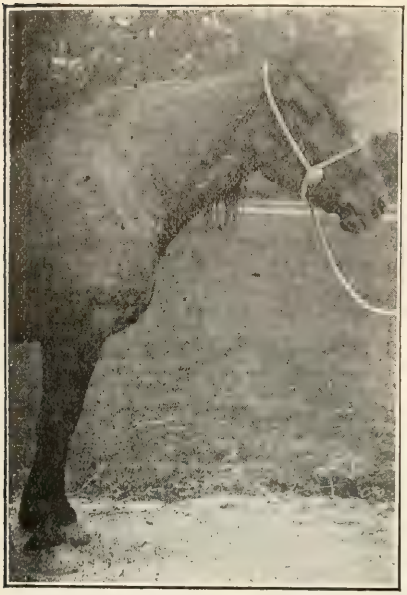
Eyes.—Should be large, bright, mild in appearance, sound, free from cloudiness, white spots or ring, not staring and bulging as in palsy of the sight (amaurosis), each of the same color, lids free from wrinkles, discharge of tears over face is objectionable. Test eyes by gently threatening to strike them with hand. Horse should flinch under this test; pupils of eyes should be elliptical in form, not spherical, and should contract when exposed to the light on coming from a dark stable.

Forehead.—Should be wide between eyes as an indication of intelligence and profile of face should not be too prominent (Roman nose) or too much dished.

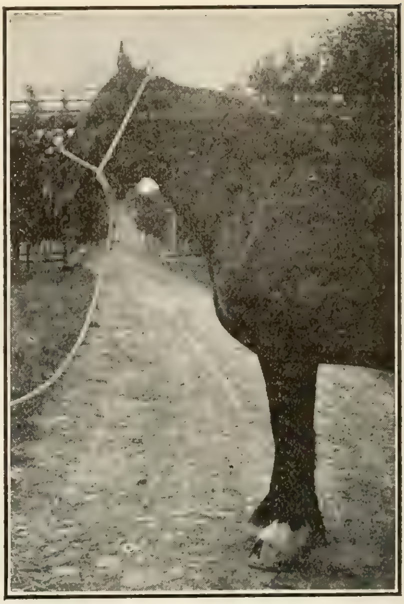
Ears.—Should be of medium size, proportionate according to size of body, pointed, well carried, not coarse. If rigid, suspect deafness; if too alert and constantly moving, suspect eye disease or imperfect vision. They should be free from slits or other injuries and from discharging fistula at base.

Lower Jaw.—Angles should be wide and space between jaws clean and free from abscesses or tumors. Jaws too close together mean poor masticating capabilities and horse is usually a "hard keeper."

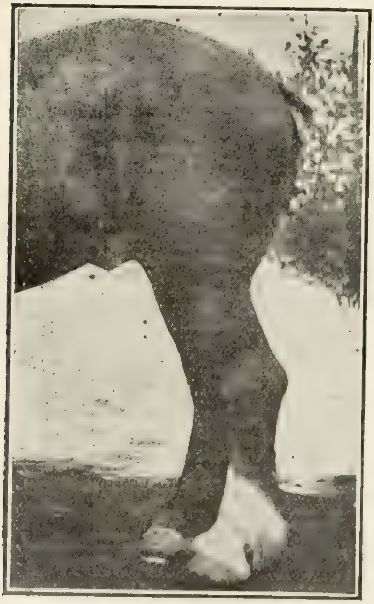
Neck.—Should be strong, massive, of sufficient length, well arched, covered with strong muscle, nicely and neatly fitted into head, clean at poll and throat-latch, molded evenly and snugly into withers and shoulders, sound at seat of collar, mane full and lying properly, free from sores in skin, windpipe large and prominent, jugular vein uninjured by bleeding.



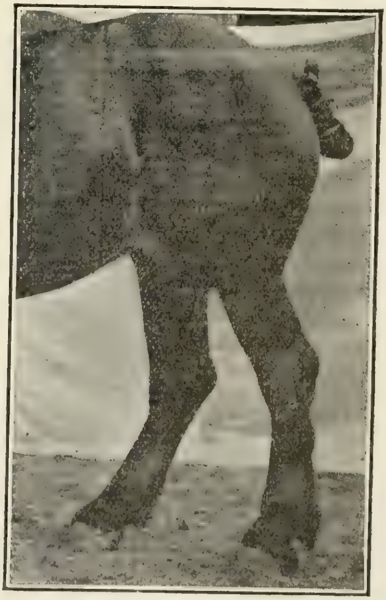
FORE LEGS DEFICIENT FOR DRAFT HORSES.
Pasterns too upright; feet weak.



GOOD SHOULDERS AND TYPE OF FORE LEGS FOR DRAFT HORSE.
Pasterns moderately sloping; feet strong.



CORRECT DRAFT CROUP.



CROUP TOO DROOPING.

Shoulder.—A majority of poorly formed draft horses have too steep shoulders. The proper type is moderately sloping and sufficiently so to afford a comfortable and secure bed for the collar. Straight or rather upright shoulders detract from easy action of fore legs and are usually associated with upright pasterns. Should be smoothly and deeply covered with muscle, show no prominent angularities, protuberances, sores or tumors, and fit snugly into neck and body. Withers should be fairly high, free from sores or discharging sinuses (pipes).

Arm.—The arm is formed of the humerus and extends from point of shoulder to elbow joint. It should be strong, short, well-clad with muscles, thrown back sufficiently to bring the leg into proper place to support weight of fore quarters. Elbows should be prominent, strong, clean and not carried too close or too far from sides.

Forearm.—This portion of the body, together with the gaskin or second thigh of the hind leg, cannot well be fattened. Muscles and bones give these parts their size, width and depth. The forearm should be long, broad, wide, muscles prominent above, balance of part clean and free from meatiness.

Knees.—The joints cannot well be too large and strongly developed in each bone entering into their composition, so long as they are free from puffs, meatiness, bony growth or other unsoundnesses. Knees should be wide, deep straight, strong, clean, properly set and not tied in under joint. Sprung knees are objectionable as are the reverse, known as "calf knees." Splints on sides of cannon bone, close up to the knee, are liable to cause lameness and are to be considered dangerous and objectionable.

Cannons.—These bones extend from knee to fetlock joint in fore and hock to fetlock in hind legs and should be large in size, short, clean, wide, flat-appearing, free from meatiness and puffs, tendons very prominent at sides and behind. "Feather," if present, should be fine, silky, and springing from rear part only. Such hair indicates fine quality of dense bone and is usually associated with good development of strong tendons. Coarse, kinky hair, growing from rear and sides of the cannons, indicates coarse skin and spongy bone, gives the legs a round appearance and is indicative of sluggish temperament and susceptibility to grease, etc.

Fetlocks.—What has been said about "feather" applies most particularly to this joint which should be strong, wide, deep straight, free from puffs, interfering sores or callouses, not knuckling forward or set too far back.

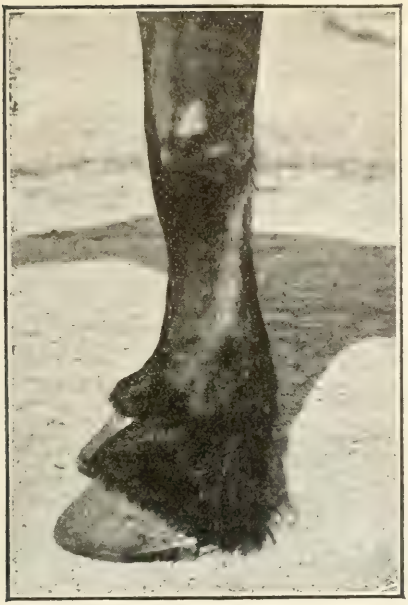
Pasterns.—Formed of the long pastern bone (os suffraginis) extending from fetlock to hoof-head (coronet) should be strong, wide and moderately sloping; not short, upright and stilty looking. The average draft horse inclines to steepness of pastern and consequent stubbiness in gait. Very long, weak pasterns that bring the back of the fetlocks too near the ground, are objectionable as they cause strain upon the tendons and detract from ability to handle heavy loads. Too short, distinctly upright, pasterns are even more objectionable. They prevent springy, elastic action of the feet and by immediately transferring concussion from the ground to the foot and bony column superimopsed thereon jar the parts and set up irritation and inflammation which are apt to result in such unsoundness as navicular disease, side bones, ringbones, quarter crack, corns, contracted heels and kindred troubles. The bone of the pastern should have a slope of about forty-five degrees and the front of the hoof fifty degrees. Upright pasterns induce stubby action and horses having such conformation wear out quickly upon the streets. Springy, elastic action comes from oblique yet strong pasterns and the feet under such wear well on the pavements.

Ringbones are deposits of superfluous, granular bone at the upper, middle or lower portions of the pastern bone and in aggravated cases cause lameness and involve and interfere with the proper action of the fetlock joint above or with the joint between the lower end of the pastern bone and upper part of the coronet bone at juncture of horn of hoof and hair of hoof-head. They give a bulging appearance to the part of the bone affected, have the feel of bone and constitute unsoundness. They affect the pastern and coronet bones of both fore and hind feet.

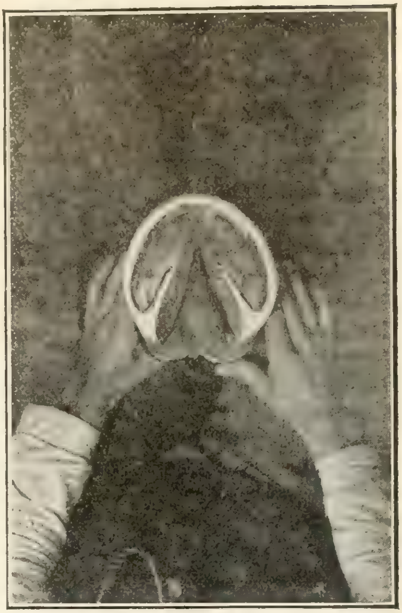
Sidebones are located at the quarters, near the heels, at the juncture of hair and hoof. They are due to the lateral cartilages (elastic plates) at these parts changing to bone (ossifying). When present they may be detected as prominent, hard, bony masses protruding above hoof at the sides of the feet towards the heels and bulging the hoof under the part involved. When sidebones are absent the cartilages can be grasped between the fingers and thumb and moved or bent from side to side as if they were formed of stout rubber. Sidebones are common in draft horses and constitute unsoundness. Horses having very wide, flat, low-heeled hoofs are most subject to this unsoundness. Stallions or mares afflicted with sidebones or ringbones should not be used for breeding purposes unless the unsoundness is confined to a single foot and known to be the result of a barb-wire cut or other injury. In the case of public service stallions a qualified veterinarian should always be employed to decide whether sidebones or ringbones are present and he will best be able to judge whether or not the condition descovered constitutes hereditary unsoundness.

Splints are abnormal bony excrescences formed at the sides of the cannon bones where the small splint bones (metacarpals, in front, metatarsals, in hind leg) overlie the large cannon bones. They are objectionable, cause lameness when forming, are often an idication of light bone but ordinarily should not be deemed to constitute hereditary or transmissible unsoundness. It found on all legs, of large size and associated with other bony growths (exostoses) they may indicate a hereditary susceptibility to such bony growths (bony diathesis) and the animal should be rejected as unsound for breeding purposes.

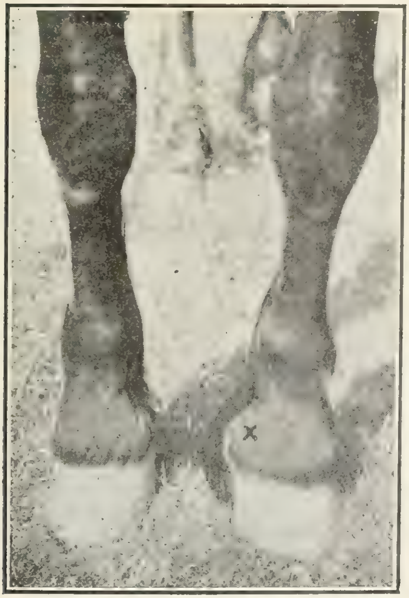
Feet.—The hoofs should be of good size, sound in texture, waxy and healthy in appearance, free from wrinkles, ridges, cracks proceeding from the hoof-head downward, and prominent projecting growths at the toes, indicating chronic founder (laminitis). The color of the hoof is of little importance so long as the hoof is sound, fully developed, healthy and properly formed. The hoof is a continuation of the skin of the leg and takes its color from that of the skin of the coronet and pastern. Dark



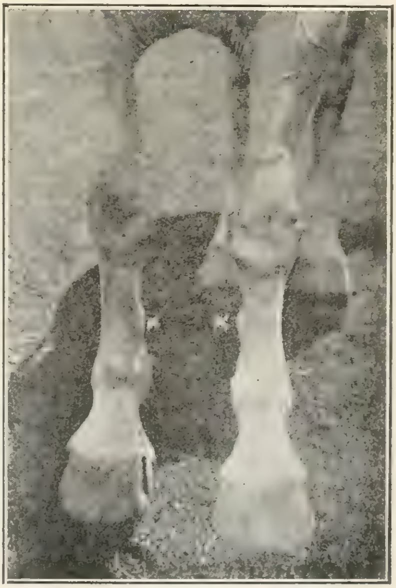
GOOD TYPE OF DRAFT HORSE PASTERNS.
"Moderately Sloping."



SOUND, "OPEN" HOOF, SHOWING WIDE HEELS, PROMINENT FROG AND STRONG "BARS."



X A PROMINENT SIDEBONE.



XX SPLINTS.
Bad "quarter crack" on right foot

horn is, however, popular with many horsemen. The hoof-head should be prominent, heels wide, strong, not to close to the ground. The sole should be sightly concave, not markedly convex or flat; the frog large, healthy, elastic free from deep cleft, bars prominent. Small, brittle, flat, weak, low-heeled or great, spongy, soft, brittle feet as well as those that are notably unsound should be avoided in selecting breeding horses.

Chest.—The chest should be of sufficient size, depth and width to give ample capacity for accommodation and free action of the lungs and heart. Large girth back of the elbows generally indicates such capacity, endurance, vigor and easy keeping qualities. The reverse conformation is objectionable in all horses. Great width of chest, with the fore legs set too far out, causes rolling motion and is objectionable. Width of chest should be accompanied by properly laid shoulders, arms and elbows so that the action is unimpeded and straight.

Ribs.—It is highly important that the ribs should be well sprung so that the digestive organs shall have ample room. A round, deep barrel bespeaks good digestive capacity and means strength of constitution and ability for hard work if the body is deeply and evenly clothed with muscle. The last ribs should be deep and come close up to the hip constituting a close "coupling." With this conformation goes a low carried flank, indicating an easy keeper. The reverse—long, weak, washy, shallow coupling—indicates poor keeping qualities, tendency to scour, constitutional debility.

Back.—The draft horse should have a short, wide, thick, strong, straight back giving room for attachment of large, powerful muscles and given its size and shape not only by spring of rib but development of the muscles alluded to.

Loins.—What has been said of the back equally applies to the loins. In stallions a weak low back will be apt to grow more pronounced in its weakness with age and service. In mares the back is naturally longer but should be strongly supported at the coupling and deep in flank.

Hips.—There is great diversity of form in the hips of draft horses. On general principles it may be said that all drafters should have wide strong muscled hips, free from prominent angles, smooth and neither too straight nor too drooping in croup. The straight or level croup is characteristic of the thoroughbred horse and his coss-bred descendants. In draft horses the very steep, drooping croup, probably taces to the old black horse of Flanders. It is highly objectionable as it allows less space for the attachment of the powerful muscles of the hind quarters and is very often associated with slouchy action of the hind legs which are advanced too far under the body when in motion. The amount of muscle upon the croup is however of even more importance than the degree of slope of the part. Great development of muscle in every direction is absolutely necessary at this part of the frame in every draft horse and the same statement applies to the thighs and quarters which should be similarly well supplied with muscle. The tail should be well set and carried, strong, well haired, free from sores and without tumors (melanosis) on under side and about auns.

Stifles.—These joints should be strong, thick with muscle, free from dropsical swellings showing plain indentations above and below the patella (knee cap) and properly set so that they are neither too close nor too far from the body when resting or in motion.

Gaskins.—What has been said of the forearm applies here but in examining this part (second thigh) care should be taken to determine that "thoro'pins" are not present as fluctuating enlargements noticable at each side and running under the large tendon just above the point of the hock joint.

Hocks.—The draft horse has no more important joint than this and it is commonly the seat of many diseases or weaknesses. The hock (not "hind knee" has to withstand a tremenduous amount of strain and should consequently be large in every direction, clean in all respects, free from meatiness, puffs, gumminess, bony growths such as spavins and soft distensions termed "bog" or "blood" spavins. The hock joint should look and feel hard, firm, its constituent bones severally detectable under the fingers, its skin fine, and its tendons and ligamnets prominent and free from connective tissue. A "coarse" hock, given that appearance by the size and prominence of its bones, is the best hock so long as it is absolutely free from all of the other features of coarseness and unsoundness. It should be wide and deep, viewed from the front and side. Its point should be prominent, clean and sharp and the tendons under it straight, distinct but free from bulging.

Bone spavin is a deposit of superfluous, granular bone upon the surface of or among the small bones on the inner, lower aspect of the hock joint or may involve the true joint higher up or appear upon the outer aspect of the joint, high or low. The former is however the common seat of bone spavin.

Bog and so called "*blood*" *spavins* are identical and are soft, fluctuating distensions of the synovial bursae of the joint, and giving a bulging appearance to the lower, front aspect of the joint.

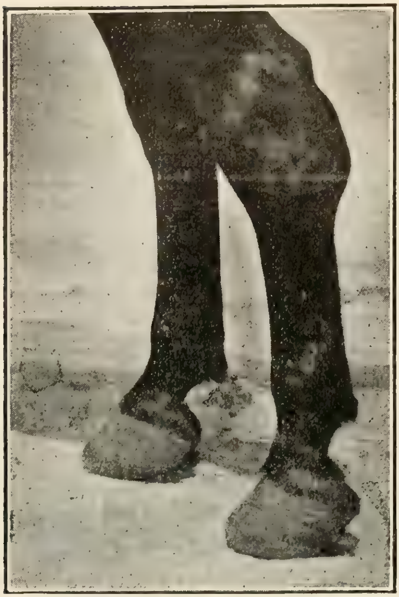
Susceptibility to contract both of these conditions is transmitted by affected sires and dams. Sprain or other injury of the joints sets up the irritation and inflamation giving rise to spavins in weak hocks and those of poor conformation.

The same is true of *curb* which appears as a bulging, indurated or calloused enlargement upon the rear aspect of the hind leg, just under the hock joint and implicating the tendons and ligaments of that part.

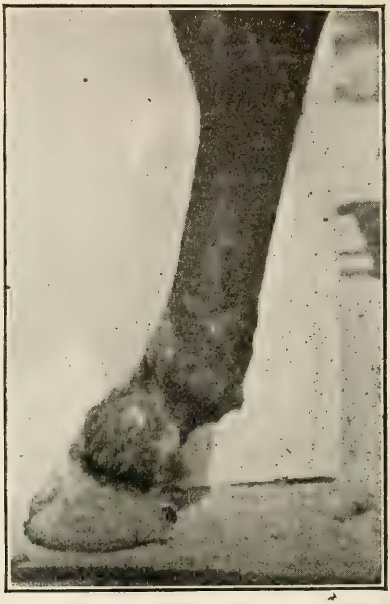
Crooked or "*sickle hocks*" are most prone to this injury and curb which follows undue strain when at play or work.

Actual unsoundness implicating the hock joint and objectionable conformation rendering the joint liable to contract disease or become sound should be carefully avoided in the selection of breeding stock.

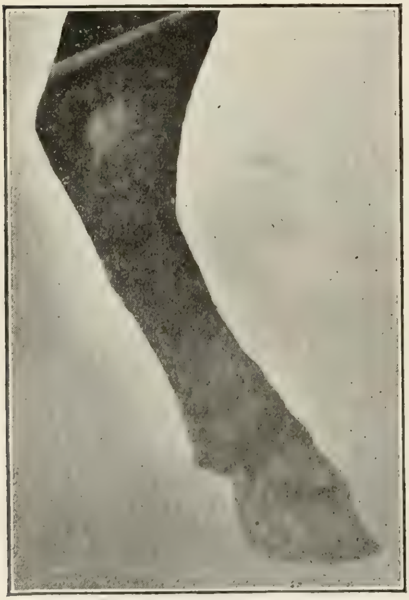
Cannons, Fetlocks, Pasterns, Feet.—What has been said relative to these points in the fore limb applies with equal truth to the like parts of the hind extremity. The cannons of the hind leg should have the same wide, flat appearance desirable in those of the fore leg.



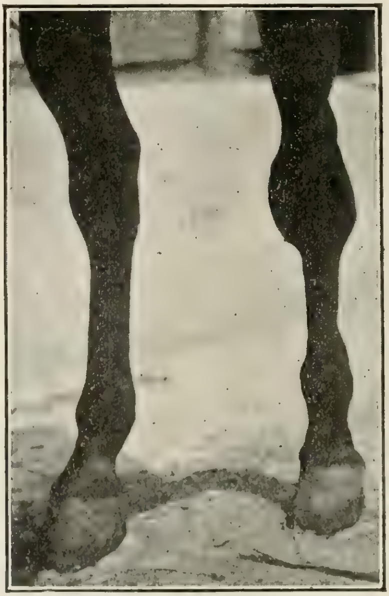
PROMINENT RINGBONE ON PASTERN.



UNSOUND HOCK JOINT SHOWING LARGE CURB.



CROOKED OR "SICKLE" HOCK.



UNSOUND HOCK JOINT SHOWING BOG SPAVIN, ETC.

In examining horses having hairy legs care should be taken to search for evidences of grease, such as old scars and fissures, grape-like tumors, or discharge having a foul odor. Sidebones are not commonly found on the hind coronets. Ringbones implicating the hind pasterns are as serious as those of the fore feet, from a hereditary standpoint, but the lameness due to them is more easily cured by puncture firing and blistering.

In *spavin lameness* the horse goes out of the stable lame and works out of the lameness after going a short distance. On moving him "over in the stall he is apt to jerk up the affected limb and the toe of the shoe will be found worn thin. The test for spavin lameness consists in lifting the foot of the affected limb, holding it up towards stifle joint for a few minutes to "shut" hock joint tightly, then dropping foot and at once trotting horse, when, if affiicted with bone spavin, he will go much more lame than was previously the case and, in bad cases, go on three legs for a rod or two.

Cohrea (shivering or St. Vitus' dance) is best seen when moving the horse from one side to the other in stall or backing him out of stall. The leg is jerked up once or twice at these times and the tail and muscles of flanks may quiver momentarily. These symptoms of the disease disappear when the horse is exercised.

Cribbing, windsucking and weaving also are best discovered when the horse is in his stall, and although not certainly hereditary are highly objectionable and determinental unsoundnesses.

TYPICAL FIRE TEAM. (Jack and Jack, of Des Moines Department.)

SCORE CARD—LIGHT HORSES.

SCALE OF POINTS.	Possible Score.	Points Deficient.	
		Student's Score.	Corrected.
Age			
GENERAL APPEARANCE—28 POINTS			
Weight ....lbs, actual			
Height, estimated............hands; actual	2		
Form, type—symetrical, smooth, stylish	4		
Quality, refined; bone clean, fine; tendons, clean, defined, prominent; hair and skin, fine	4		
Action, walk: long, fast elastic, regular, straight; trot. rapid, regular, straight	15		
Temperament, active, disposition good	3		
HEAD AND NECK—11 POINTS			
Head, proportionate, well carried, features well defined, profile straight	2		
Muzzle, neat, nostrils large, flexible, lips thin, firm, even	1		
Eyes, full, bright, clear, large, same color	2		
Forehead, broad, full	2		
Ears, medium size, pointed, well carried, alert	1		
Lower Jaw, angles wide, space clean	1		
Neck, muscled, arched, throat-latch, fine; windpipe, large	2		
FOREQUARTERS—20 POINTS			
Shoulder, long, sloping, smooth, extending into back.	3		
Arm, short, strong, muscled, thrown back, well set	1		
Forearm, long, wide, clean, muscled	2		
Knees, straight, wide, deep, strong, clean, strongly supported	2		
Cannons, short, clean, wide; tendons, large, hard, clean, prominent	2		
Fetlocks, wide, straight, strong, clean	1		
Pasterns, lengthy, sloping, strong, clean	3		
Feet, medium size, even, sound; horn dense, waxy, soles concave; bars strong, full; frogs large, elastic; heels wide, one-half length of toe; vertical to ground	6		
BODY—10 POINTS			
Withers, high, extending well back	1		
Chest, deep, low; girth large	2		
Ribs, deep, well sprung, close-coupled	2		
Back, broad, short, strong, muscular	2		
Loins short, wide, thick, muscled	2		
Underline, long, low; flanks let well down	1		
HINDQUARTERS—31 POINTS			
Hips, smooth, wide, level	2		
Croup, long, wide, muscular, not drooping	2		
Tail, attached high, well carried	1		
Thighs, deep, broad, strong, muscular	3		
Quarters, deep, plump with muscle	1		
Stifles, strong, clean, muscular	2		
Gaskins, (lower thighs) long, wide, muscular	3		
Hocks, large, strong, wide, deep, clean, well set	7		
Cannons, short, clean, wide; tendons, large, hard, clean, prominent	2		
Fetlock, wide, straight, strong, clean	1		
Pasterns, strong, sloping, springy, clean	3		
Feet medium size, even, sound; horn dense, waxy; soles, concave; bars strong, full; frogs large, elastic; heels wide	4		
Total	100		

Animal .... *Date* ....

Student .... *Standing* ....

POINTS OF THE LIGHT HORSE.

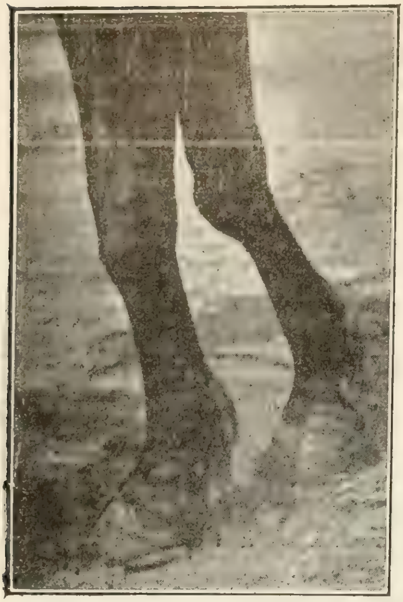
On general principles most of the requirements mentioned in describing the points of the draft horse equally are applicable here, but refinement of character throughout the frame, excellence of quality, high spirit, nerve, stamina, endurance, grace, action and intelligence must be of a higher order. According to its special purpose the light horse must have the specialty highly developed and be perfectly equipped in every way for the performance of its work. "Blood" shows even more prominently in light horses than in the more phlegmatic drafter and should be evidenced by style, nobility, grace, beauty of every curve and outline, dignity and refinement. The skin should be thin, pliable, glossy showing veins and tendons plainly, while the hair should be silky, free from coarseness and fine, long and flowing in mane and tail. The body and limbs should show every requirement of strength and endurace, lack all impedimets to speed and free action and give the impression of trained athletic capacities.

Head.—A clean, "breedy" looking head, free from surplus flesh and fat, wide between the eyes, straight, neither Roman-nosed or dished, fine in skin, showing veins and muscles distinctly; neat, firm, refined in muzzle, having large, flexible nostrils, lined with pink membranes; lips, thin and firmly controlled; jaw bones wide apart and clean; eyes, full, clear, fearless yet mild, bright, sound; ears, fine-cut, pointed, alert, free from coarse hairs, erect, and of proper proportion, characterize the arisocratic trotter, thoroughbred and "gentleman's horse." Departures from any of these requisites detract from beauty, breed, character or utility.

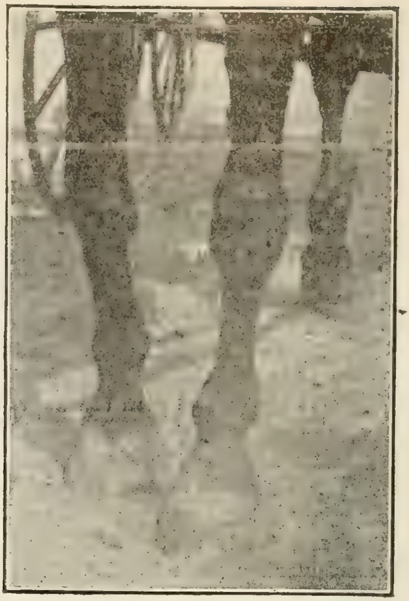
Neck.—While the draft horse's neck is somewhat short and heavy from wealth of powerful muscle that of the light horse should be long, graceful, covered with long, thin, refined muscles, prettily blended into the head at the throat-latch, free from pronounced glands about the throat, arched, camparatively thin, not "ewe-necked," not notched downward in front of the withers, but smoothly molding into that part and the shoulders. A large, prominent windpipe, together with wide, flexible nostrils indicates lung capacity and necessarily endurance. A small windpipe and dilated, rigid or over distended nostrils may indicate defective respiratory organs.

Chest.—In connection with what has been said about nostrils and windpipe the shape and size of the chest may next be most properly considered. While great width of chest is less common and not so necessary in the light horse, as compared with the draft horse, it is imperative that there should be great depth and capacity for fully utilized lungs and heart. Great speed would be prevented by too much spring of rib under the shoulders of light horses but the girth should be large and the sternum (breast bone) well let down.

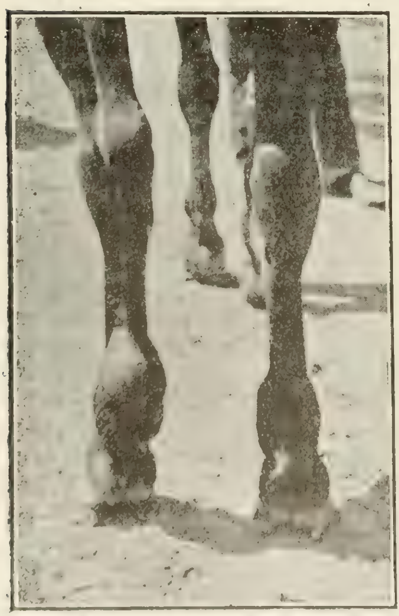
Shoulders.—While we have set down the correct type of shoulder for the draft horse as "moderately sloping" the light horse on the contrary should have long, oblique shoulders to give him great leverage and strong control over his legs for fast, free long striding gait at the walk, trot or run. Such a shoulder is also necessary to the safe saddler that must not stumble and must be springy and elastic in his action for



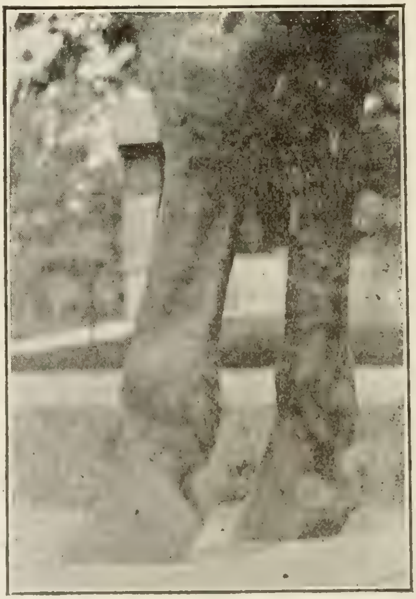
UNSOUND KNEES.



UNSOUND, CROOKED FORE LEGS.



"WIND-GALLS" AND THICKENED BACK TENDONS.



UNSOUND "COCKED ANKLES" CAUSING "KNUCKLING."

comfortable riding and in the high stepper to make "trappy" knee action possible. Upright shoulders and pasterns of similar shape cause stilty, stumbling, stubby action and are even more objectionable in light than in draft horses. Together with proper conformation in the respects noted the muscular development of the shoulder should be as perfect as possible.

Bones, Joints and Feet.—Both in front and behind the light horse should have leg bones of the finest quality—flat, cordy, like a razor blade with the wide part forward and the thin edge behind and from it protruding, boldly and prominently great, dense, clean straight tendons. Such legs last, stand wear and tear, are formed of dense, ivory-like bone and are free from meatiness. All of the joints should be large, clean, set at correct angles, free from puffs, bony growths and other forms of unsoundness and should be perfectly flexed when walking or trotting. Long forearms and gaskins with short, strong cannons, long, sloping, well supported and perfectly clean pasterns, springing from open, large coronets and above sound, dense, waxy, smooth sound hoofs that are not too low or too high at the heels give the muscular, well-bred light horse ability to go fast, endure work, withstand concussion and beget the right stamp of underpinning if he is used for breeding purposes. Departures from correct conformation, in any one of the points mentioned, will be more apt to injure the action of a light than a draft horse. Absolute soundness and perfect quality of material are necessary in the legs of a horse that has to be campaigned and any weakness will soon aggravate into an unsoundness or cause of lameness under the stress of fast work.

Body.—Great depth of body is desirable at the heart girth and here the elbows should not cling too close to the sides or they will impede motion. Similar depth of barrel, viewing the horse from the side, is often due to lack of spring of rib and this is undesirable. Well sprung ribs are desirable in all horses although they may give an appearance of legginess which is not actually present. A round barrel, with low flank, means good keeping qualities and, even in the fast horse, this shape is to be desired although training will reduce the size of the abdomen and so, apparently, raise the flank and possibly give the coupling an appearance of too great length. A short, strong coupling is desirable, so long as the underline is long but not too much cut up in flank. The back should be broad, well covered with muscles, the croup long and muscular, the thighs deep, full and plump with muscle extending well down over the gaskins, while the quarters, viewed from behind, should be full, thickly muscled and not of the too common "cat-hammed" type.

Hind Legs.—What has been said of the legs in general should be borne in mind and it is especially necessary to insist upon strong stifles and the largest and soundest of hock joints, which, in trotters, are set low on account of long gaskins but should not incline to "sickle" shape encouraging the throwing out of curbs or be too straight, shortening action and inducing thoroughpins and bog spavins. Tendons should be large, free from puffs and straight when viewed from the side. "Bowed" tendons, bulging profile of the front of the cannons ("buck shins"), "broken down" pasterns and unsoundness of the feet in front or behind, generally indicate some error in conformation that has given rise to undue strain or concussion.

All of the unsoundness mentioned in speaking of the draft horse are to be avoided in selecting light horse breeding stock and in addition we would advise rejecting for use stallions and mares that have peculiarities of conformation inducing any form of lameness or in any way departing from the requirements upon which depend, to a great degree, ability for any one of the purposes of the trotting, pacing, running, jumping, saddle, coach or carriage horse.

TYPE OF STEEP CROUP.

CAN AMERICA GROW HER OWN DRAFT-HORSES?

WALLACES' FARMER.

It is time that farmers and breeders in the United States were taking up this question seriously. Years ago there was an impression, very srong in England, which the farmers of the United States shared, that the United States, on account of climatic reasons, would always be dependent on England for continued supplies of the best blood in growing cattle and sheep, and on England, France, Belgium and Holland for cattle and horses. We are getting over that now with regard to cattle and hogs; and while we will no doubt be benefited by an introduction of new blood, especially in cattle, it may well be doubted whether England would not also benefit by the introduction of the best strains from America. We will no doubt be benefited by the introduction of some of the bacon breeds of hogs from England, but it has been demonstrated time and again that America is capable of producing a lard hog—that is, a hog adapted to the environment of the corn belt—equal to any in the world.

The English, French and Belgian breeders of any kind of live stock have one very great advantage which the Americans will not have for some time to come. The English people put a great deal higher value on country life than the American has heretofore done. Farms remain in the same family from generation to generation; and where the family has a taste for live stock and an ambition to keep up the family name, the son and grandson take up the work that the father and grandfather laid down, and these farms acquire a national and often an international reputation. Then, again, these countries are cursed to a far less degree with the speculator in breeding stock, who jump in when prices begin to advance, creates a boom, sometimes gets out with a whole skin, and oftentimes, with poetic justice, is crushed by the collapse of the boom which he has promoted—hoisted, so to speak, by his own petard.

The main question to be considered is whether the soil and climate of America are capable of developing, if not the highest type in some particular direction, the type best adapted to the American environment.

In a preceding article we pointed out in broad general outilnes the soil and climate the world over adapted to the breeding of the draft-horse. America has a large section of this draft-horse country—larger, in fact, in acreage and in the capacity to produce the highest type of draft-horse, provided the blood were once introduced, than all of Europe, Asia and Africa put together has for this purpose. Why not, then, make a concerted effort to grow our own draft-horses, and of the breeds which after being tried for a generation prove themselves adapted to the soil, climate and labor of the country?

The first question that arises is: Have previous efforts been a success; or, rather, have we developed a class of draft-horses equal, or approximately equal, when the breeding has been considered, to those which have been imported from the older countries? In a previous article we called attention to a type (we would not call it a breed) of draft-horse in Pennsylvania usually called "Conestoga." In our investigations we found a rather interesting piece of history on this line. We were familiar with these horses in our boyhood; in fact, were raised among them. Our readers who have had similar breeding and training will read with interest a description of the Conestoga horse from the pen of the late John H. Wallace, who perhaps gave more year of study to the American horse than any other man who has ever lived.

WALLACES' FARMER

THE HIGHEST TYPE OF DRAFT GELDING.

As our readers all know, his studies were directed to the standard-bred horse, of which breed he may be considered the founder. In his book, "The Horse of America" (not as well known as it should be), he undertook to give colonial horse history, and obtained the material for this history from a most patient and careful investigation of the advertisements in county papers of the seventeenth and eighteenth centuries, gathering from these advertisments the heights and weights of horses which were, so to speak, the natural expression of the different latitudes and longitudes in the United States.

Speaking of the size of the native horse, he tells us that in New Jersey a law was passed in 1731 that all colts eighteen months old and running at large, under eighteen hands, should be gelded. In Virginia, in 1724, a law was enacted that colts eighteen months old might run at large if thirteen hands high, and if older than that they must be fourteen hands. An advertisement in the *South Carolina Gazette*, in 1744 gives the average of the horses of that state as thirteen and a half hands, and fifteen hands was a very large horse. This with reference to the common stock of the country. He goes on to show that the riding-horses of Pennsylvania, in the first half of the seventeenth century, were uniform in size, and the exact average was thirteen hands one and a quarter inches in height. Then, referring to the Conestoga or draft-horse of Pennsylvania, he says:

WALLACES FARMER

A team of imported stallions at work on farm of Will F. Hooker, Page Co., Iowa

"In that grand old repository of ancient, curious and valuable things relating to colonial affairs, the New York Historical Society, to which I am greatly indebted, I found a file of the *Pennsylvania Gazette*, commencing with the year 1792, published by 'B. Franklin, printer.' In that day the term 'editor' or 'reporter' was not known in the vocabulary of any well, regulated newspaper office, and for anything of local character you had to look in the advertising columns. To these I resorted, as usual, and they presented results that were a great surprise to me. Pennsylvania has long been famous for the production of great, massive draft-horses, and before the days of railroads just suited, with six or eight of them in a team, for the transportation of freights from the seaboard to the Ohio river. This was a great business at the beginning of this century, and for forty or fifty years afterwards. The fame of those great teams, the great wagons and the great loads they hauled over the mountains spread far and wide; and as a special designation that went with them they were called "Conestoga" horses and the wagons were called "Conestoga" wagons, named after a creek in Lancaster county, Pennsylvania, where many large horses were bred. There was no particular line of blood to be followed, for a large horse bred west of the mountains was just as certainly a Conestoga as though he had been bred in Lancaster county.

"The Conestoga was simply the horse that was best suited for a big team with an enormous load, and he varied in size from sixteen and one-half to eighteen hands in height, and from 1600 to 1900 pounds in weight. These measurements he reached by breeding for the one purpose of strength and weight. It is safe to conclude that in the latter part of the last century breeding animals of large size were brought over the water, for we can hardly conceive of their being descended from the little pacers preceding them only fifty or sixty years."

It appears from this that the draft stallions advertised in the middle of the eighteenth century were from sixteen and a half to eighteen hands high and weighed from 1600 to 1900 pounds, and he concludes that there must have been an importation of larger horses, for it is inconceivable that these should have descended from the little pacers of fifty or sixty years previous, only thirteen and a half hands in height.

The recollections of our boyhood days with reference to horses correspond very closely to this testimony. It matters not where this blood came from originally. The fact remains beyond all question that in the richer valleys where they grow big wheat and big blue grass and big corn and big clover they also grew one of the best types of draft-horses ever grown in this or any other country; not as large as the largest specimens of draft-horses now, but horses that could make a journey with wagons carrying enormous loads for 300 or 400 miles on the macadamized roads, which in itself would weed out the weaklings. It is a great pity that no great breeder ever undertook the task, which would have made him famous for all time in America, of developing this noble breed of horses by selection. The building of the railroads naturally changed the type of horses. What was then wanted was greater size, for dray work in the cities, and this accounts for the disappearance to a great extent of this breed, and the attempt to obain greater weight by importing horses, in the same way that the eighteenth century saddle-horses disappeared with the advent of better roads and carriages.

The last time we were back at the old home, in talking the matter over with some of the old boys, they shook their heads, and said they did not believe the imported horses had in any way improved the breed; that, in fact, it had deteriorated in the quality of the bone. We cite this, however, to show that there need be no fear on the part of any intelligent man as to the possibility of the American farmers developing their own type of draft-horse, using, of course, the best blood available. In fact this work has already begun. Our best-known importers are also breeders. There are importers who are not breeders, but merely speculators, just as there are in cattle, hogs, or any other kind of live stock. These men have never been of any advantage to any breed of live stock they ever undertook to boom.

The question therefore arises: Can the better class of American farmers undertake this work? Why not? The average price of an imported stallion, as shown by the reports made to the custom-house by the importers themselves, is not very far from $400. Cannot the farmer afford to buy the best brood-mares that are entitled to pedigree and mate them with the best stallions, whether imported or not, and sell the product at such figures?

In the past, and, no doubt, for some time to come, there will be magic in the word "imported", the assumption being that there must be some special virtue, some special merit, in an animal which somebody valued sufficiently high to go to the expense and risk of importing from a foreign country. On this same principle, we are told that men buy "imported" wine, in blissful ignorance of the fact that it may be, and often is, grown in California, shipped to France, put up in French bottles with French labels, and sold to credulous tipplers under the impression that they are getting something superior. We are also told that American cheese has often been shipped to Canada, put up in new dress, and sent back with the brand "imported".

Now, the mere fact that a horse, cow or anything else has been imported does not necessarily add anything to its value. Its value must depend upon the individual merit of the animal and not on its travels by water or land from one country to another.

There is no doubt but that in developing this American breed of draft-horse we must rely upon foreign blood, but it must not be blood brought over for the purpose of speculation, but purchased on account of its actual individual worth and pureness of pedigree or correct breeding. Given these, even approximately and the American farmer can not only breed a superior class of draft-horses but grow them cheaper than they can be grown in any part of the old world.

Farmers who know a good draft-horse when they see it, and secure the best stock they can find, will, in our judgment, make big money in the next ten or fifteen years by using these draft-mares and stallions, where they own one, in the ordinary work of the farm, and selling their colts to men whose business it is to develop them, or feeding them on balanced colt rations and then selling them to horse-breeders. This is the way the thing is done in Belgium, England, and Scotland. In France and Belgium, particularly, the man who grows the colt is seldom the man who sells the stallion. We do not think that the farmer who has good horses entitled to registry, and mates them with intelligence, will need look long for a purchaser of a first-class colt for $100 at weaning-time, and occasionally he will produce one that will be cheap at twice the money.

Let us get rid of the notion that we are absolutely dependent on the breeders of the old world for any kind of live stock. In some parts of America, and often in many parts of it, the soil and climate are of a character to grow these equal to any part of the world and cheaper than any other part of the world. The old world will take all the good horses we can grow, and at good prices. The only question for us to consider is how to go about it to get the best blood, and then how to develop it in the best way.

RAISE DRAFTERS IN THE CORN BELT.

FARMERS' TRIBUNE.

There is perhaps no class of farm animals concerning which there is more difference of opinion than horses. Whenever the horse topic is discussed at farmers' institutes and some one reads a paper on the advantages in breeding heavy drafters on the farm, there are always half a dozen men ready to show that the best all-around horse for the farmer is what is termed the general-purpose horse. They claim that it costs more to keep a heavy horse than a lighter weight animal; that the light horse can do most of the farm work as well as the heavy animal, and that he can do a great deal of it with greater ease. There is objection urged against the drafter in the corn field; he is said to be unnecessarily heavy for the drag; he is not the animal that can take the family to town in a hurry; and there is only one place where a plea can be made in favor of the drafter, and that is for heavy hauling. Even in this capacity it is claimed that the light horse can often do as well as the heavy one because our roads are poor and not well graded; there is usually a few big hills somewhere between home and town for which the farmer must load. By straining his small team a little bit and by taking a little more time in going over the hills, many farmers claim they can haul as big loads with the general-purpose horse as with the drafter.

Such are the arguments usually advanced against the heavy horse and it must be admitted that there is more or less truth in them. The larger the horse the more it takes to keep him and he is not fitted for light road work. At the same time it cannot be disputed that every man who works a farm of 160 acres can make good use of at least one heavy team. A team of mares that will weigh from 3,000 to 3,400 pounds is a most valuable farm team. A span of mares of that weight, while in one sense of the word they are heavier than is required, in another sense they are better able to raise a pair of colts each year and do a lot of hard work at the same time than are lighter mares of which there are altogether too many in the country. There is one thing that cannot be disputed, heavy horses are the most profitable when it comes to selling them. There has been a growing demand for heavy drafters for the past ten years. This demand has in no way decreased. The fact of the matter is it seems that the demand for these horses in our large and still growing cities can not be satisfied. It is safe to say that it will not be satisfied in the next ten years to come; it is safe to say that even after that time if horse prices should decline that the heavy drafters will still be more profitable in the corn belt than light weight horses.

These heavy draft horses must be raised in the corn belt. There is no other place where they can be raised. To produce them rich pastures and good grain are required. The western man will continue to raise what we call western horses, and he is abundantly able to supply the demand for this class. It is, therefore, left to the farmer in the corn belt, to raise the horse that the western man cannot; to raise the horse which brings the largest returns for food consumed. The corn belt farmer can not afford to raise the light horse; the western farmer can. Farm land in the corn belt has increased from $25 to $75 per acre during the last 10 or 15 years. It will increase as much in value during the next 15 or 20 years. By that time instead of farming on $75-an-acre land the man in the corn belt will be farming on land worth $125 to $150 per acre and upwards. He will have to make that land pay or go out of the business. The supposition is that he will make it pay.

The time is coming when nothing but pure-bred horses, cattle, swine and live stock of all kinds will be raised in the corn belt. That time may be 50 years hence; it may be farther off than that, but is is surely coming. The man who begins today will be traveling on the right track. He will be setting a pace that those less able to foresee the future will follow in years to come It may be true that it is still too early to urge every man to raise pure-bred horses. The average farmer in the corn belt is not yet prepared to do this. He is, however, prepared to sell off part of his small mongrel horses on the farm and substitute for them good heavy grades of some draft breed. It does not matter so much whether he buys Percheron, Clydesdale or Shire grades, but let it be clearly understood that it should be a grade in which blood of some well known draft breed predominates; let it further be understood that the grade selected must be bred to a pure-bred sire of similar blood.

Back in '75 when the craze for imported sires began to take root there was much indiscriminate breeding. Native horses were crossed with Percherons, Shires or Clydesdales. In the majority of instances the mares were of the roadster type, and consequently did not nick with the stallions used. That was no more than could be expected. Crosses of that kind, while they sometimes produced good colts, they often produced offspring of inferior quality. In too many cases when inferior colts resulted from these crosses farmers concluded, if they had been breeding to a Percheron horse, that the Percheron was not the one wanted. Consequently they switched around and bred the colts of the first cross to some other draft breed and instead of improving the first cross they made matters worse. Had they stuck to the breed with which they started they would have become successful in a few years. As it was, thousands of farmers had a mixed lot of horses on hand and the country became flooded with stock that was not marketable. It was not the kind of horses that the city patrons wanted.

This indiscriminate breeding continued until in the 90's. In '93 the panic came and the bottom fell out of the horse business. Since then farmers have hesitated about raising horses fearing that it will be overdone again. They are afraid that by the time they have a crop ready for the market, prices will again decline. That is a mistake. We predict continued high prices for horses. There may at times be some decline in prices, but there will also be advances even over present prices and the man who sticks to heavy drafters will be sticking to a business that, taking everything into consideration, will bring him more money than any other live stock on the farm. We do not mean to discourage those who prefer to raise roadsters, coachers and saddle horses in preference to drafters. There is a demand for these at good prices, but it cannot be denied that there is more risk in raising horses of this type than there is in raising drafters.

This is an age of specialists. We are all agreed that the man who has a specialty and devotes his entire attention to that specialty is more apt to make a success than the man who dabbles in a little of everything. At any rate, the specialist is in demand. What is true of man is true of live stock. The special-purpose horse, the special-purpose cow and the special-purpose hog are the animals that are and will continue to be the most profitable ones to raise. The American people want the best of everything. When they are looking for a roadster they want the best; when they are looking for a horse to pull heavy loads they want the best, and they are willing to pay a price that will enable the producer to raise the best. Everyone is embued with the well known saying, "the best is the cheapest in the end." No man can raise draft horses more economically and develop them more fully than can the farmer. The mare doing moderate work will produce a more vigorous colt than the mare of the professional breeder that has to run in the pasture from one year's end to the other. If we will raise horses from mares and stallions whose muscles are toughened by labor, our chances of securing horses adapted for the severe work demanded of them on the streets in our large cities will be much better than if we raised them from mares that are never even broke to harness.

It is becoming more difficult from year to year to hire farm labor. For this reason farm machinery has increased rapidly. New machines are being invented, older machines are being enlarged. Instead of mowing with a four-foot mover as we did a few years ago, we now use a six-foot machine; a twelve-foot rake; a thirty-four-foot drag; larger plows and larger wagons. Instead of cultivating one row of corn we now cultivate two at a time. Man labor is constantly decreasing on the farm and horse labor is taking its place. In view of these changes even from a standpoint of economy in work, the heavy horse is actually becoming more serviceable as a working animal on the farm than the so-called general-purpose horse, which is another argument in favor of paying more attention to drafters. It costs no more to feed a horse until he is three years old than it does to prepare a three-year-old steer for the market. A steer will sell for from $80 to $100 at the very most and he is more apt to sell at the former than at the latter price, while a three-year-old draft horse, such as every farmer can raise from a high grade mare and a registered stallion, will sell at from $150 to $200. The only difference in the cost of produsing the two is in the service fee and in the increased risk, but these factors at the outside will not cost to exceed $25 per colt. It is, therefore, evident that the horse is much more profitable than the steer.

When we take into consideration that horses must be kept on the farm anyway; that it will cost only a few dollars more per year to feed a 1,600-pound mare than to feed a 1,200-pound gelding, and that the mare will do as much, if not more work than the gelding and raise a colt at the same time, it certainly appears as though the price received for the colts above the cost of keeping them until three years old, is just so much clear gain. Don't be afraid that every farmer is going to take our advise. Don't be afraid that the horse industry will be over-done as a result of this article. Farmers are not so easily convinced as that; but, if the arguments appear logical to you and if you are anxious to make as much out of the farm as possible; if you know a good horse when you see it; if you will remember that it is not only necessary to breed to heavy mares, but to mares that are absolutely sound in every respect, and that it is equally necessary that the stallion should be sound, and you live in the corn belt where blue grass, timothy and clover grow like roses in California, discard your poor, light mongrel mares and make a place for the kind that will make you more money in the next ten years than any other live stock you could put on your farm.

HEREDITARY UNSOUNDNESS IN HORSES.

F. C. GRENSIDE, V. S., New York County, N. Y. in Breeders' Gazette.

The question of hereditary unsoundness in all its aspects is by no means an open book to the horse breeder, and it is one well worth studying by him, if as thorough a knowledge as is possible of this subject will tend to lessen the percentage of unsound stock produced. Of the various causes which tend to make horse raising disappointing and unprofitable, this is the one of the important ones, if not the most important. Literally speaking it is not so much the inheritance of the disease itself that we fear but it is the tendency to the development of this disease. Comparatively few foals are dropped with unsoundness that impairs their value ultimately, but there are many that are foaled with predisposition to the development of unsoundness.

The study of this subject, then, practically resolves itself into a consideration of what constitutes the predisposing causes of unsoundness. They may be divided into several heads, viz., defective formation, defective quality and insufficient quantity of tissue and temperament. Within certain limits the practised eye of the observant horseman can determine in sire or dam the existence of these defects that are transmissable to the offspring and predispose it to the development of unsoundness. It is claimed by some authorities that some horses and mares possess a peculiar habit of body, an indefinable something about them which predisposes them to the development of some unsoundness and also their progeny. Such cases are rare, however, and their supposed existence is very frequently the result of the inability of an observer to appreciate the existense of detectible predisposing causes. If this indefinable something is the determining cause of predisposition in some cases, then the only positive evidence of its existence is the developed unsoundness.

This theory presupposes that none of the detectible predisposing causes already mentioned exists in sufficient degree in such cases so that when subjects of them are subjected to more than ordinary exciting ones, they would develope unsoundness, unless the peculiar habit of body exists. It also is an acknowledgement of the helplessness of breeders in a considerable degree to prevent breeding colts with an inherent tendency to unsoundness. No matter how capable and careful a breeder is he will produce a certain percentage of unsound stock, due to heredity, but with care it can be reduced to a small one. Many breeders use a sire from convenience or from some quality that he possesses, such as speed, action, style or disposition, knowing that they are taking a chance of perpetuating some tendency to unsoundness that he possesses. Favorite mares are also bred with a disregard to the well established principle that like begets like even when they are the victims of hereditary unsoundness or a strong predisposition to it. The successful breeder must divest himself of all sentiment and be capable of appreciating all defects which constitute predisposition to unsoundness. Of the predisposing causes defective formation is a most fertile one.

The predisposition to navicular disease is hereditary. Horses with narrow deep heels and short hoofs are predisposed to it. Some observer may say: "But look at the large number of horses one sees with narrow deep heels and short hoofs that have not got navicular disease." Of course such an argument is fallacious, as there may be many compensating conditions that will tend to neutralize the tendency to this disease in some subjects. A horse with the formation of foot described, even although he is subjected to the exciting causes of hard, fast and steady work and irrational and infrequent shoeing, may be endowed by nature with a very light step. Nothing tends to prevent wear and tear of the legs and feet like light stepping. Here then is an example of an influence which tends to counterbalance the ill effects of a defective formation, but renders complicated the study of formation in predisposing to unsoundness. One then has to weigh the influence of compensating conditions in determining the ill consequences likely to result from defective formations of foot, when transmitted to offspring. That defective formations of feet are handed down to progeny there is no manner of doubt.

The predisposition to ringbone is undoubtedly hereditary, and one seldom finds it unless it is the result of some extraordinary exciting cause when the pastern is of good formation. The two extremes of long, light oblique pasterns and the short straight, coarse ones, are both predisposed, the former from the tension to which the ligaments are subjected and consequent tendency to sprain, and the latter from the increased tendency to concussion.

As we proceed up the front leg we find defective formation in the neighborhood of the knee predisposing to unsoundness. Many horses that are more or less knee-sprung are practically sound. Others become progressively weak and are decidedly unsound, so that we are not much amiss in characterizing the condition called knee-sprung as an hereditary unsoundness.

A commission was appointed some years ago in England to make out a list of hereditary unsoundnesses, which they made as small as possible. The list included navicular disease, ringbone, spavin, sidebone, periodic ophthalmia or moon-blindness, and roaring. It will be observed that knee-sprung was not included. In order not to complicate matters they made the list as short as possible and only included the most serious forms of unsoundness or those that are very obstinate in yielding to treatment or are incurable. Unsoundnesses such as knee-sprung, curb or splint, though the tendency to them is undoubtedly hereditary, were not included. It was because these conditions seldom permanently interfere with a horse's practical soundness. A horse is what is called "tied in" below the knee when the leg immediately below the knee is narrower from before backwards than it is just above the fetlock. In this condition the tendons behind the knee are not well developed and are placed too close to the shank-bone at this point. This imperfect tendonous development in a front leg is not usually confined to the tendons behind the leg, called the flexor tendons, as an imperfect development of these tendons is usually associated with an impaired development of the tendons running down the front of the leg called the extensor tendons. Such a condition frequently results in shaky knees, if the subject experiences hard work, which is likely to become progressively worse. In some cases the flexor tendons appear to be much better developed than the extensors and in an individual so formed, particularly if he is inclined to stand with his fore feet well back under him, there is inordinate strain on the extensors leading to relaxation and a corresponding tendency to contraction of the flexors. Here we have a lack of balance between the extensors and flexors, and consequently a knee-sprung condition.

Although shaky-kneed or knee-sprung horses are not frequently incapacitated for work the breeder should not lose sight of the fact that his condition is apt considerably to depreciate a horse's value in the market, particularly for some purposes, and the breeder can seldom afford to ignore this fact. It is not intended to advise breeders never to breed to a sire that stands a little over in the knees, especially if sufficient cause can be assigned for it, but we would recommend them to be very wary about using sires and dams that show a congenital tendency to this defect. Purchasers of horses usually look with considerable disfavor on a horse that is at all knee-sprung. Personally I would rather buy a horse for my own use that is a little forward in the knees, than one that stands back in the knees or is what is called calf-kneed. A horse with the former defect is almost sure to be much more elastic in his step than one with the latter and consequently will not suffer to the same extent from the ill effects of concussion. A calf-kneed horse is also much more likely to suffer from strains. Knee-sprung, unlike the other unsoundnessses given in the list of hereditary trouble, is not very infrequently congenital.

Swan-necked horses and those with thick coarse throttles are considered to be of the formation most liable to develop the defect of the wind called roaring. In Great Britain and Ireland and on the continent of Europe breeders are usually very particular about avoiding roarers for breeding purposes. The climatic conditions there seem very favorable to its developement, but in this country it is not nearly so much to be feared and I would not hold aloof from an otherwise desirable sire on account of his being a roarer, though I admit the predisposition to the trouble may be transmitted.

The predisposition to periodic ophthalmia or moon-blindness is handed down from parent to offspring, but it is not nearly so common in this country as it once was when the sanitary conditions were not so good; and it may be that some care has been exercised in breeding so as to avoid its propagation. The only appreciable evidence of a predisposition to this unsoundness outside of the existence of the disease is the small or what is called the "pig eye." I knew a sire well that had "pig eyes," but sound ones, and that remained sound throughout his long life. Certainly ten per cent, of his progeny developed moon-blindness.

The tendency to stringhalt is undoubtedly transmissible from parent to offspring. Horses with snappy hock action are most likely to develop it. Nowadays it is not feared nearly so much as it formerly was for, if it should develope, a very large percentage of cases are curable by not a very difficult and my no means dangerous operation which consists in the cutting of a tendon and the removal of a small portion of it. A change has taken place in the generally accepted view as to the nature of stringhalt. It was considered a purely nervous malady until it was found that the cutting of a tendon would cure it.

Curb, although not as I remember it included in the list of hereditary unsoundness is decidedly hereditary as well as the predisposition to it. It is not an infrequent occurrence to find foals dropped with curbs, which frequently disappear in a large measure, but there is always some trace of them remining. It is the rarest possible occurrence to find a broad hock and one with the tendon standing well out behind with any sign of curb. Narrow hocks and those with the point dipped forward towards the body of the joint; a leg with small circumference immediately below the hock, or what is commonly called, tied-in; those with the back tendon not standing out posterior to the tions of weakness and tendency to curb, if the joint is crooked or what is called sickle-shaped, the predisposition is much increased. Curb is not so much feared by some breeders as it seldom causes permanent lameness. It is, however, a great eyesore; it depreciates a horse's value very considerably, and it is liable to cause recurring lameness.

Crooked hocks, unduly straight hocks, narrow hocks, small hocks, those bent inwards or outwards, are all of weak formation, and consequently predisposed amongst other unsoundnesses to bone spavin. Even though a horse should happen to have a bone spavin, providing he has a strongly formed hock, I would rather take the chance of breeding to him than one with a sound hock, but of weak formation.

So far we have run over briefly most of the defective formations that predispose to serious hereditary unsoundness. We have divided the causes into four heads, the second one of which was insufficient quantity. The old saying: "Size is strength, other things being equal," applies to a a horse's extremities. We frequently hear it said that such and such a horse has "plenty of timber under him." By this is meant that the individual in question has sufficient substance in the various structures that make up his legs and feet to give them strength and ability to stand wear and tear. The practical horseman of experience learns that the horse with disproportionately small feet seldom stands much work without going sore from some unsoundness of these organs. So with the slender-pasterned horse; he is not only subject to strain in that point, but predisposed to ringbone. The horse light under the knee is apt to suffer from strains of the tendons and ligaments in that situation as well as troublesome splint. Proportionately large joints give great wearing ability to the legs. This is well exemplified in the case of hocks with plenty of tissue in them. The sire that transmits small hocks to his offspring has handed down to him one of the most prolific sources of unsoundness in those joints. Defects of formation of these joints are often a cause of trouble as has already been pointed out, but not so much so in my experience as a lack of size.

Stating that a horse has plenty of timber under him does not cover all cases, as some horses have plenty of tissue in their front legs and are deficient in their hind ones. In addition to formation and quantity of tissue, quality is of vast importance in influencing the wearing ability of the legs and feet. Parents transmit with great faithfulness to their progeny defects in the quality of the horn of the hoofs. Shelly brittle hoofs are strongly predisposed to crack, developing sand and quarter-cracks on slight provocation, and giving rise to that very troublesome inability of being unable to hold the shoes tightly. Brittle hoofs are not necessarily coarse in fibre. Hoofs of coarse fibre lack the density of structure which generally contributes to toughness. Undue size of foot, low heels and flat soles, with atendency to be easily bruised, are apt to be associated with a lack of quality in the horn structure. A horse with bone of a spongy character or lacking in density is deficient in quality. Such an individual is predisposed to inflammatory diseases of bone, such as splints, sore shins, ringbone and spavin.

The lack of quality in a horse is particularly well shown in the skin of his legs. The tendency to the development of cracked heels, stocked legs, mud fever and grease is very evident on slight provocation. Sires deficient in quality are apt to transmit to their progeny the tendency to what are called soft-legs, in which there is not only the inclination of the skin to swell up from little cause, but windgalls, puffy sheaths of tendons and boggy hocks are easily induced. If then we accept these statements with regard to quality, as it would appear that every practical horseman must, we must admit that coarseness or lack of quality is by no means an unimportant factor in contributing to hereditary predisposition to unsoundness.

Temperament is the last of the four heads into which we divided the predisposing causes of hereditary unsoundness. Although it must be admitted that it has an influence we look upon it as the least important of the four. The nervous horse that jumps and gets excited on slight provocation, the anxious horse that is always up in his collar and against the bit are more taxing on the physical mechanism than easier-going horses. We perhaps cannot afford quite to ignore this question of temperament, in selecting sires and dams, but if the legs and feet have sufficient substance and are made up of a good quality of tissue, they will generally stand any taxing that may result from a high strung temperament.

PROFIT FROM A GOOD MARE.

DAN CUMMINS, MONONA COUNTY, IOWA, IN BREEDER'S GAZETTE.

I read with much interest the letters in your journal in regard to boys leaving the farm. I believe in the saying a "natural-born farmer"; if the boys are not turned to farming, what is the use of trying to keep them there—they are no good. My mother was a "pure-quill" farmer, and I must be too. I had plenty of chances to leave the farm, both good and bad, but I naturally wanted to stay. I always loved the thought of fine horses, hogs and cattle. My mother was for a woman the best judge of a horse I ever expect to see; it seemed to me she could look a horse in the face and tell all his faults. While she lived I would not think of buying or trading for a horse without her opinion, no matter if the horse was any account or not.

When my father decided to leave the farm two years ago this spring he had one brood mare to sell. Her dams for five generations had been owned here on this farm by him. I knew her and her family thoroughly; she was a three-quarter Percheron, heavy with foal, five years old, and weighed around 1,850 pounds. I bought her, paying $200 for her. She dropped a colt in less than a month from a registered Percheron stallion. The day he was eight months old I took him and his dam into town to have them weighed; he weighed 870 pounds, she weighed 1,870 pounds.

Before returning home I led them up to my mother's house and called her out to see them. She was in very poor health, but she came out, looked them over and talked a bit. When I started away she said: "Be good to her, Dan, for she will make you more money than anything you have ever bought." This spring I sold the first colt (the stallion) for $250 at one year and eleven months old, weighing 1,470 pounds and black as a crow. I have the mare in foal left, seven years old and sound as a pewter spoon, also a hondsome yearling filly seven-eighths grade.

My mother's words are coming true. She only lived a short time after that.

THE BROOD MARE AND HER FOAL.

BY JAMES VINCENT, D. V. M.

The brood mare, one of the noblest animals that grace the farm pastures, is many times not given the care and attention due her. Year after year she rewards her careful and thoughtful owner with the best specimens of his herd, which, in due time, we see him driving to town hitched to his family carriage, or to a load of produce from his farm; in either case it needs no telling that he is proud of the offspring of the old mare on the farm.

The owner of a brood mare looks forward to the following spring when he expects to see—he hardly knows what, unless he is a thoughtful student of the law that "Like begets like." Even then we sometimes see disappointment on his countenance when he looks for the first time on her offspring. With a studied gaze he is thinking of the surroundings and conditions that she has passed through—may I say enjoyed—during the previous year? Has her life been one of constant hard work, ever fatigued and seldom having a good day's rest?

The thoughtful owner of the brood mare will first see that she is bred in her line, no out-breeding or mongrel crosses, that so often bring disappointment.

The food of the mare should be of the best, given in moderate quantities, so that she will always have a keen appetite, relish her meals and always meet you with a kindly call when it is feeding time, or when she hears the feed can rattle. Always see that the food is eaten up to the last grain at each feeding time. This should consist of a little bran and oats, possibly an ear or two of corn. This time of the year, if the mare is compelled to work hard, she will require more grain, so plenty of bone and muscle-making food should be provided, such as bran, oats and a little wheat; also a little barley or speltz is good. Care should be given at all times to see that all feed is free from dust or mold of any sort.

If the mare is not required to be kept in harness she should be allowed to run to pasture in the warmer seasons of the year where she can have plenty of shade and good, pure water. In the fall and winter (here in the corn belt), she should have access to the stalk fields also, when the weather permits; but when the stormy and severe cold weather sets in she should be provided with good, roomy sheds or a box stall that is well bedded. When out in the field she should not be compelled to run with older horses or geldings that are apt to fight her, causing her to jump and many times slip, thus endangering the life of her unborn foal.

The brood mare should at all times carry a reasonable amount of flesh; an abnormal amount is an objection. Though many mares in this condition seem to do well, it is not generally deemed the best. When in this condition many times the foals are ill shaped, or under size; many times very crooked, and often weak in the joints and unable to rise to their feet unaided.

As the time for the new foal arrives she should be guarded and watched with care, as it is a critical time, both for her and her foal. It should be seen to that she has plenty of exercise, and by all means she should be out on bright sunshiny days. If they are not given this attention the draft mares, more especially, are likely to get what is known as "colt stiffs," or as she nears the time of the birth of her foal, large dropsical swellings will appear on the floor of the abdomen. These are caused by an interference with the circulation on account of the weight of the fetus on the large blood vessels. In such cases all rich grain or milk producing feed should be withheld until all these conditions have disappeared, either before or after foaling.

After foaling, if a heavy milker, she should be allowed to spend a part of several days in a dry lot; should be fed good hay and not be allowed too rich pasture, as it may cause trouble with the colt, which may be unable to take all the milk. In case she is a scanty milker she should be given a reasonable amount of milk-producing grains, in addition to having access to pasture.

At the time of foaling an attendant should always be present for the portection of both the mare and the colt. If she does not foal in a short time proper assistance should be had at once, for the lack of this at the proper moment may mean the loss of one and perhaps both animals. The colt born and breathing well, the attendant should next direct his attention to the navel cord. Afer it has stopped pulsating he should have a string, which has been dipped in a good disinfectant solution, ready to tie around the cord about three inches from the body. This done the cord may be severed two inches below the string, after which the whole region of the navel should be disinfected. This should be done several times a day until the navel is well healed. Especially is this necessary if the colt is about the stables, as it has a greater chance to become infected by coming in contact with filth than if out in the pastures. Tannic acid and sulpher, mixed in equal parts, is a good disinfectant with which the navel may be frequently dusted.

After the colt has sucked and is a few hours old it should be noticed whether its bowels have moved, and if so, to such an extent that they are loose. If this does not take place in the course of three hours the assistant should not wait longer, but should supply himself with warm soap suds and a good syringe and stay with his patient until the bowels have moved freely. There are as many colts lost every year from lack of attention to the bowels as from navel leak, and both can be corrected by a good attendant at the proper time.

Do not attempt to give the colt anything by the stomach with the object of moving the bowels, as you will fail oftener than you will succeed and such treatment will derange the whole digestive system; while with the syringe you will remove the cause of the trouble without interfering with the other digestive organs.

If, after the colt is a week or so old, the mare is needed for her work, the colt should be broken to halter and allowed to stand a few hours at a time, tied to the manger during the absence of the mare, but they should not be kept apart for half a day at a time; the mare's udder becomes too distended and the colt too hungry for the good of either. There is also danger of the mare's udder suffering and of the colt's bowels becoming deranged from an over amount of milk taken at one time from a mare that is heated and more than likely fretted and excited.

I have often seen a colt or a pair of colts taken to the field with the mares, tied to a wagon and left at one end of the field. Several times during the half day the colts were allowed to suck and in a short time, say two or three days, they were turned loose and they stayed at the end of the field waiting for the mares to return, not trying to follow them about the fields and wearing themselves out. They would content themselves with picking around and would always feel fresh; while in the other case, as soon as the mare had stopped and the colt sucked it would drop down and stretch out on the ground, showing its fatigued condition.

SMALL MARES AND HEAVY STALLIONS.

BREEDERS' GAZETTE.

A reader in Oakland, Missouri, asks this question:

"Please tell me if common work or scrub mares weighing all the way from 900 to 1,400 pounds may safely be mated with a Percheron or Belgian stallion weighing 1,700, 1,800 or 2,000 pounds. If so what sort of a draft horse will the produce be in regard to weight and market value?"

Mares of the weights named have for years been bred to heavy stallions. There is no danger to be feared in parturition. It has been said by those who do not like the draft horse that if a small mare is bred to a stallion much larger than herself she will have trouble in the foaling and probably die from not being able to get rid of her offspring, but that is all rubbish. Of course it is true that mares have died from this cause, but it was not for the sole reason that the foal was begotten by a stallion much larger than the dam. Nature regulates all that sort of thing in its own way. The danger is not in parturition but in mating, in the event that the mare is not large enough to bear up the horse, while in the act of breeding. There is however little to fear even with a mare of 900 pounds and a horse of twice her weight.

It is a well known axiom that Nature abhors a union of widely differing types. The more different the parents the greater is the likelihood that the progeny will be a misfit. As a rule it has not paid to mate very small mares with large stallions. As a result of such breeding many colts have come into the world possessed of the body of the drafter and the bone of the trotter, or vice versa. Some have had fairly shapely bodies and heads large enough for animals of twice their weight. In fact the business of mating 900-pound mares to 1,800-pound or larger stallions is fraught with danger as to the pecuniary results.

There is however a wide difference between mares weighing 900 pounds and mare weighing 1,400 pounds. The latter or those weighing 100 pounds less may safely be bred to a ton horse. The resulting progeny is likely to partake largely of the draft character in outward appearance and disposition. We believe it is better to make a start with very small mares with a stallion of correct conformation and type but weighing not more than 1,500 or at most 1,600 pounds. As a rule such light draft stallions are finer in quality than the heavier ones and therefore are more closely related in conformation to the fine-boned light-bodied mares. Draft-bred horses weighing not more than 1,400 pounds in thin flesh have been successfully used to make the first cross on mares weighing around 800 or 900 pounds.

It is true that some very well shaped horses of heavy weight have been produced by small mares to the cover of very heavy stallions, but the preponderance of testimony is that when there is a violent mixing of types the progeny will come of the misfit order. As to the market value of the colts, it all depends on the size and breeding of the mare. If she weighs 1,400 pounds and has some draft blood in her, which is altogether probable at that heft, the foal will in all probability grow up into a saleable animal, but if the mare weigh only 900 pounds and is of common blood it is problematical altogether what the foal will ultimately amount to and therefore no prospective value can be assigned to it.

GOOD HORSES NEED GOOD CARE.

BREEDERS' GAZETTE.

As the writer wended his way cityward last week a farmer owning, clear of incumbrance, a farm of 240 acres asked: "Will it pay me to buy two purebred mares? I can buy a pair for $500 and I thought that it would be good business."

This farmer is not a good feeder of anything from horses to chickens. He thinks that it is a waste of grain to give his fowls an atom of it in summer, spring or fall. He says they can find plenty of hoppers and grubs to live on, and if they are fed they will not scratch for their own living. As might be suspected this man's team does not show either much flesh or care. Tails are full of burrs gathered along the roadside on which he turns them out at night to graze for the reason that if they get something to eat there they do not get it out of his fields.

The reply to his question was this: "You would better let pure-bred stock alone unless you are prepared to give it pure-bred care."

If a farmer cannot keep a pair of 1,100-pound scrub geldings in flesh and heart it is a foregone conclusion that he never will do anything with pure-bred draft mares. It is well enough to say that every farmer should keep pure-bred stock, and so he should, provided he knows enough to care for it; but if he can not or will not care for a scrub team there is no hope for success with pedigreed mares. Pure-bred stock needs feed. It cannot be maintained on scrub rations, scrub methods. The man who knows enough to feed his horses so that they keep fat all the year around can afford to buy draft brood mares.

TURNING MARE AND FOAL ON GRASS.

BREEDERS' GAZETTE.

A subscriber in Georgia asks this question:

"I had a valuable mare drop a foal at noon just after she came out of the harness. She was doing farm hauling and did not seem to be distressed when unhitched. She ate part of her oats and then began to sweat. My foreman took her out of the harness and turned her into a small lot, whereon she lay down and was delivered very easily of what seemed to be a lusty colt. I fed the mare liberally as before and when the foal was two days old turned the two out to pasture. In ten days the foal was dead from scours which nothing would stop and the mare seemed to lose 200 pounds of flesh. They were not housed nor fed after being turned out. I think that grass should have been enough for them."

In replying to this question the writer labors under the disadvantage of not knowing just exactly what sort of grass the mare was turned on. It is probable that it was Bermuda or lespedeza or some of the other southern sorts, but in any case the principle has not been touched. When a mare taken from the harness and hard feeding drops a foal, then is, within forty-eight hours, turned on grass with her foal, the death warrant of the youngster at least is signed then and there, just as surely as though he was shot by the hand of his owner.

When a mare is worked reasonably up to the time of her foaling, conditions for parturition are as a rule ideal, and a "lusty" foal is to be expected. Once on his feet the little one gets a drink of the colostrum which has been formed from a rich grain diet and presumably all goes well with him until the fatal mistake is made. Without a moment's warning the diet of the mare is radically changed.

Now a foal is a busy little sucker and gets about all the milk his mammy gives time and time again per day. On the grass the flow is much increased. The composition of the milk is changed and there is lots more of it. Instead of a rather meager supply of grain-made milk there comes down on increased flow and then the trouble begins. He goes at the dug again and again, drinking eagerly the fresh grass milk so bountifully supplied. More trouble follows. The mare loosens up and her milk causes the foal to do likewise. In a very short time he has a well developed case of scours, showing indigestion and the utter inability of his little tender stomach to care for the much increased volume of changed food poured into it. Indeed the grass made milk has merely been so much poison to him, and it makes no difference where this thing happens—from "Zemblia's shores to far Peru"—the result will be the same. Therefore it will not pay any owner of a grain-fed mare suddenly to turn her and her colt out on the grass.

If the mare has been accustomed to run on pasture at night, to get her three feeds a day and to work, then she may be turned out in three days after foaling, or even sooner, but her grain must be continued for best results. It she has not been on grass at all the transition must be worked very gradually, only a few minutes at a time to begin with. It is well known that mares suckling foals and the foals themselves should have some grain every day of their lives, but every one will not beileve this. However, it will stand the unbelievers well in hand to bow to the dictum at least until the foals have passed beyond the danger point.

WEANING THE COLT.

FARMERS' TRIBUNE.

A correspondent writes that he has a 5-months-old colt. He wants to know when this colt ought to be weaned as well as how it ought to be treated during the coming winter in order to secure the best results. The colt is out of a heavy draft mare, and he is anxious to make as big a horse out of it as possible.

If our correspondent has not taught his colt to eat grain, he should by all means do so at once. Most colts learn to eat grain with their dams during the summer season, but even in such cases it is a good idea to halter-break them and let them eat by themselves before weaning. Having become accustomed to this, the weaning process is less difficult. Care should be taken not to overfeed the colt while it is still sucking its dam. It is not necessary to feed large quantities of grain, but some should be fed, and bran and oats make a good cambination. The grain should be fed in two or three feeds per day. A good strong colt may be weaned at five months, but we would prefer, if possible, not to wean it until it is six months of age. Some prefer to wean colts abruptly, that is, to take them away from the mares and not allow them to suck after that at all, while others prefer gradual weaning by allowing them to run to the mares once per day for a week or such a matter, milking the mare to some extent previous to allowing the colt to her, and in that way gradually cut down the supply of milk.

After the colt has been weaned, it is important to look after the mare. Bathe her udder at least once a day with cold water and a little spirits of camphor. Spirits of camphor dries up the milk glands. Do not allow the mare to become feverish at any time.

Where space will permit, a box stall is perhaps the best kind of a stall for the colt during the first winter. A young colt needs plenty of exercise and he will take a great deal in the stall if it is large enough. We do not mean to convey the idea, however, that the colt needs no more exercise than can be secured in the stall. Far from it. He should be turned out doors every day during the winter months. It is not advisable nor profitable to leave him exposed to rain or wet snow storms. He is better off in the barn on cold, wet days. Dry cold, however, does not hurt him. Those who have well covered blue grass pastures have an ideal place for the colt's play-grond as well as the best kind of a lot. There is probably nothing better in the way of roughage than that provided by a good blue grass pasture. Blue grass is rich in protein; it is also rich in ash constituents, hence it is a great muscle and bone builder and muscle and bone is what we desire to develop in the colt.

In addition to grass, the colt must be fed grain and we know of nothing superior to a mixture of oats and bran, which after weaning we would feed at the rate of about two pounds per day per hundred pounds of live weight. If the colt can consume more than this to advantage, and the feeder is the only man who should decide this point, we would feed more. This ration may serve, however, as a general guide. In case blue grass pasture is not available for winter use, the colt should be fed all the hay he will eat. Clover and timothy mixed makes a suitable roughage. When we say the colt should be fed all the hay he will eat, we do not mean that the manger should be stuffed at all times, but rather that he should be fed all he will eat up clean twice per day in the course of an hour or an hour and a half after each feeding period. Anything left after that time should be removed and the amount regulated so that every feed will be consumed in approximately that length of time. It is a poor plan to have the colt's manger stuffed with hay from morning till night, as then he keeps eating more or less all the tmie. The digestive organs need periods of rest—this applies particularly to colts, but to older horses as well. In raising calves or pigs, much stress is put upon the necessity of keeping animals growing rapidly from birth until maturity. This applies with equal force to colts.

A colt should never be allowed to lose his foal flesh any more than a calf should be permitted to lose its baby flesh. A colt that is stunted during its first winter will never make as good a horse as it will if it is fed a liberal ration of grain and is kept in good flesh throughout the first winter season. It is even of greater importance that the colt should grow rapidly the first winter than the second. In addition to the food mentioned, especially where blue grass pasture is not available, a small feed of carrots every day is one of the best things we know of for the colt. Don't over-do the feeding of carrots, but feed one or two good carrots once per day, say at noon. Don't forget that the colt needs salt. It is also advisable to feed a little sulphur and ground gentian root. This may be mixed with the salt as follows: Mix equal parts of sulphur, ground gentian root and dried sulphate of iron. To this mixture add an equal quantity of salt and again mix thoroughly. Keep this mixture in a dry place where the colt may have constant access to it. In this way, while the colt is consuming the salt it also gets a small amount of the drugs mentioned, which will prevent worms and other similar stomach troubles.

Keep the colt stall clean. It should be cleaned at least once per week. Manure that is allowed to lie in the barn for a longer time than that begins to ferment and heat, and fermented manure is injurious to the colt's feet and since it is very important that a horse should have well developed feet, too much stress can not be put upon this point. Keep his stall well bedded with clean straw and keep his feet trimmed so that they may retain normal shape. Remember that even if the colt is allowed plenty of out-door exercise, he is still under artificial conditions and consequently is not apt to wear his hoofs off as rapidly as they grow. If the toes are allowed to get too long and the heels too high, the colt is apt to sustain permanent injury.

WHERE TO BUY STALLIONS.

FARMERS' TRIBUNE.

In many communities farmers' associations have been established for the purpose of owning stallions in partnership. This is a very good idea and enables them to breed up their horses economically. Usually the stallion is cared for by one member of the association who is naturally a good horseman. Where good stallions are procured at reasonable prices results are invariably satisfactory. There are, however, many instances where farmers are swindled. That is, poor horses are palmed off on them at prices away above their market value. It frequently happens that a company of farmers of this kind buy stallions without any written guarantee, trusting in the integrity of the vendor, who sold them the animal. Poor results are often obtained in communities where the stallion has been purchased from some local horse trader, who goes about and picks up a comparatively cheap horse that either has some blemishes or is a poor breeder, and then sells him as a first class animal. Farmers cannot be too careful in this matter, and as a rule we would advise them not to purchase from local traders, but to deal directly with reputable breeders of pure-bred stock.

There is extant throughout the country an idea that an imported stallion is much superior to one that has been bred in this country. The impression is abroad that any stallion that has been bred across the water must be a better animal than any produced in this country. One reason for this is that in France, for instance, from which country a great many of our imported stallions come, the government exercises supervision over all registered horses kept for breeding purposes. The government will not allow an animal that is below the standard of his breed to be sold for breeding purposes. This without any question is a most excellent practice, and has done a great deal for the breeding up of French draft horses. At the same time it must not be forgotten that the stallions raised are not all top-notchers. There are always some comparatively poor individuals among each year's crop. Furthermore, the very best individuals of a breed are seldom if ever for sale. This, however, does not mean that imported horses are not in many cases very excellent, but what we wish to bring out in this connection is that there are some horse importers who go to foreign countries and instead of purchasing the best individuals that are for sale, purchase rather poor stock, bringing it to this country for the purpose of being peddled out to people who do not fully understand the good points of a horse. These animals are not sold at lower prices than the best individuals, and hence it is that in many cases farmers buy stallions that are not what they think they are.

There is no reason on earth why we cannot breed as good horses in this country as they can in France or in other foreign countries. In fact, there are reasons for believing that we can breed better horses in this country, and hence, we would urge farmers to pay less attention to imported horses and more attention to the very best stallions bred in this country. There are many advantages in using home bred stock: First, a man may visit the stud of a breeder and inspect his stock before purchasing. He can study the dam and the sire of the horse he purchases, which is never the case when he purchases an imported animal. Furthermore, if he trades with a reliable breeder he can secure all the written guarantees that any man could reasonably expect, and therefore, can go back on the breeder should the stallion not prove to be as represented. Again, a home-bred horse is acclimated and is therefore, in much better breeding condition than is one that has been imported three or four months prior to the breeding season.

One factor that is usually lost sight of is the importance of line breeding. If one purchases an imported stallion it is rarely the case that he can secure another one containing the same strains of blood in his veins. On the other hand, if the stallion has been bred in this country he can go back to the breeder and secure an animal bred similar to the first one, and since, other things being equal, such an animal will "nick" better with the offspring of the former stallion, this is an advantage that should not be lost sight of.

Another point that is worthy of consideration is that we should patronize home industry. No doubt our readers are aware of the fact that importers have to pay a fee of $100 per animal for registering a stallion in this country. This in itself is quite a large sum, which must be added to the cost of importing the animal, risks from such importation and all the expenses connected therewith. In other words, whenever an imported stallion is purchased we must pay several hundred dollars for something that is of no real value to the practical farmer. One can usually purchase a home-bred stallion for from $500 to $1,000 less than an imported one, thus the original cost of the home-bred stallion is not only less, but the risk is also smaller. We have no doubt whatsoever but that in the future the general public will realize the fact that we can breed horses in this country just as well as they can in other countries. In fact, we believe that the day will come when this country will be exporting rather than importing stallions. We, therefore, urge the farmers who are thinking of purchasing stallions this spring to patronize home industry. But whether you decide to purchase an imported or a home-bred horse, deal with the importer or the breeder direct and don't depend upon the peddler, who is too often disposed to palm off inferior stock for a big price.

AMOUNT OF HAY FOR THE WORK HORSE.

JOHN BUCKLER, IOWA AGRICULTURAL EXPERIMENT STATION.

Horsemen generally have much to learn on the subject of feeding hay to horses. The average man allows the horse to be the judge of how much hay he should have, this being gaged by the animal's capacity, and thus many a good horse is ruined.

The writer has had a wide experience in the care and feeding of draft teams for a period of fifteen years. This experience has been acquired under a variety of conditions, part of the time having been spent in Canada, part in Michigan and the last four years at the Iowa Experiment Station. It has been my privilege to weigh all hay and grain fed to horses since coming to this station, and I have never found it necessary to feed more than one pound of hay for every hundred weight of the animal. For example, a 1400-pound horse should not get more than fourteen pounds of hay per day.

The above amount of hay and a grain ration composed of corn, oats and bran, mixed in the proportion of fifty pounds of corn, fifty pounds of oats, and twenty-five pounds of bran, will make any horse fit for a hard day's work. One will generally have to feed from one to one and a half pounds of grain per day to every hundred weight of horse. The smaller amount may do when he is at light work and the larger amount when at heavy labor. I find that such a mixture as this fed along with the amount of hay mentioned will keep a horse cheerful and make him pleasant to work. The grain ration is sufficiently fattening, while it is also flesh-forming enough in character to impart a decidedly wearing quality to the muscles.

It is true that some horses will eat much more hay than the amount mentioned, but it is a mistake to increase this quantity, as a horse can only digest and assimilate a certain amount. Keep in mind that his appetite generally goes beyond his powers of assimilation. In many cases horses that eat large amounts of hay become hard-looking, while they have little life or snap in them. Men go on from year to year with their horses in this condition without knowing anything about its cause.

It is usually advisable to use only a small amount of hay in the morning and also at noon, thus making the night feed somewhat more liberal, though not enough but what the horse will clean it up in a reasonable length of time and then lie down for a comfortable night's rest. In connection with sensible hay-feeding, it should be mentioned that horses should receive water before and never immediately after a meal. It goes without saying that hay should always be clean and bright, and if this is the case the kind of hay does not matter so much, though I have a preference for timothy and clover mixed in about equal proportions. Although timothy hay is not very rich in nutrients, there is something about it that the horse dearly loves, so that it should be kept in mind that palatability has much to do with digestibility and therefore it is wise to cater to some extent to the animal's tastes.

Those who feed thirty and forty pounds of hay a day to a work horse will take but little stock in the weights above mentioned, but, as stated before, this has not been guess work with me, as it has been necessary here, in connection with our experiment work, to weigh all the feeds used for the live stock on the experiment station. Under such treatment as described above our horses have always looked well, while they have been obliged to put in a good ten-hour day through the season of the year when they could work on the land.

THE TREATMENT OF NAIL-PRICKS OF THE HORSE'S FOOT.

E. L. MOORE.

The cases forming the basis for this work were for the most part presented at the regular clinics of the college, although some were private patients, and in the latter cases there were no special means for control beyond what one usually finds around the farm. When the horse was presented at clinics he was placed upon the operating table in order to confine him and prevent undue movement during the operation. In a few cases only was the injury of recent date. The term foot will be held to include only those structures inclosed within the horny box.

Briefly reviewing the anatomy of this part, it will be found to consist of a framework made up of three bones: the lower portion of the short pastern bone, the navicular bone and the coffin bone. These bones are united in such a manner as to form a joint, the navicular joint. At the upper and back portion of the coffin bone and on each side are the lateral cartilages, half-moon shaped pieces of gristle extending upwards above the wall, and backwards towards the heels. Occupying the entire space behind and between the wings of the coffin bone is the plantar cushion. This structure acts much as does a rubber heel on a shoe. Over all is drawn a specialized skin, covering all of the parts much as a sock covers the foot. The skin, according to the character of the horn which it secretes, may be divided into five regions, the periople, which secretes *coronary band*, which secretes the middle layer of the wall; the *sensi-* the thin varnish-like layer covering the outer surface of the wall; the *tive laminae*, which secretes the inner layer of the wall and bind the wall to the foot; the *sensitive sole*, which secretes the sorn sole; and the *sensitive frog*, which secretes the horn frog. In addition, the foot is richly supplied with blood vessels and nerves.

Even slight injuries to the foot, on account of the character of the offending body as well as to the fact that the foot is constantly in contact with dirt and filth, are almost universally accompanied by pus formation. The pus being imprisoned by the firm horn, presses upon the sensitive structures within, causing exquisite pain, and lacking free outlet, it burrows its way under the horn, separating it from the skin which secretes it, i. e., the horn becomes "under-run." The charatcer of the lameness thus produced varies somewhat with the portion of the foot which is affected. In general there is a tendency to favor the foot in standing, and as the foot is brought to the ground in walking or trotting the horse distinctly avoids bringing weight to bear upon the wounded portion. A careful examination of the foot with the hand, the hoof-testers and the hoof-knife verifies the suspicion. The old saying, "If a horse is lame in his head, examine his foot," should be religiously held in mind.

The method of treating these cases is as follows: A twitch is placed on the horse's nose, the foot is then thoroughly cleansed with soap and water, after which the horn is freely cut away from around the affected point until by the oozing of blood it is positive that all under-run portions of the horn have been removed. The foot is now washed in a solution of mercuric bichloride 1-500, a piece of absorbent cotton is saturated in a solution of the same strength and applied so as to cover the wound; another piece of cotton of sufficient size to cover the entire foot is then soaked in the same solution and firmly bandaged over the foot, allowing a part of the cotton to extend above the bandage; a thick coating of tar is then applied over all. The tar serves to retain the bandage in place, and, of more importance, prevents any germ-laden dirt or moisture from reaching the wound. On account of the cotton extending above the bandage it is an easy matter to pour a 1-500 solution of bichloride of mercury into the top of the bandage and rely upon its reaching the entire foot. Frequently this daily application of bichloride (1-500) is made by means of a rubber bulb syringe, the end of which is introduced between the cotton and the foot. This dressing is to be left in place for from seven to ten days without being disturbed. Unless complications arise, such as swelling above the bandage, the longer time is to be preferred. At the end of this time the dressing is to be removed, and if any pus is still present the bandage is to be applied as before; otherwise the foot is now washed with a 1-500 bichloride solution, thoroughly dried, and then dusted with a powder consisting of equal parts of iodoform and tannic acid. The same powder is freely applied to a large piece of cotton and the foot again bandaged and coated with tar. The foot is now left undisturbed for two weeks. At the end of this time another dressing of iodoform and tannic acid may be made if necessary. As a rule, however, little need be done at this time except to provide some protection to the newly forming horn. This may be accomplished by means of a leather sole placed underneath the shoe.

The keynote of success in following this method of treamtent lies in the complete removal of all portions of horn that have become under-run with pus, and the thorough cleansing and asepsis of the foot.

The following cases are described as illustrative of this method of procedure, and show what may fairly be expected in the way of results:

Case A.—A large gelding, which had the history of going lame suddenly on the right hind leg, and was unable to bear weight upon the same. There was also considerable swelling above the hoof, extending upward as far as the fetlock joint. Subsequent examination showed that all of the frog and fully half of the outer portion of the sole was under-run with pus. All such portions were completely removed and the foot bandaged in a bichloride solution as described. The owner was directed to pour some sublimate solution into the top of the bandage twice daily. In a week this bandage was removed, the foot again washed in a sublimate solution, thoroughly dried and dressed with a powder consisting of equal parts of iodoform and tannic acid. This bandage was left in position for ten days, and as at the end of this time new horn had formed to replace that which had been removed, he was taken to the farrier's and a shoe applied with a false sole of heavy leather underneath it. The horse was now allowed to resume his work of plowing.

Case B.—This case is reported in order to show what untoward results may follow what is too often considered an unimportant injury. A mare sustained a nail prick of the frog, involving the underlying sensitive structures. No attention was paid to the case until the pain had become so exquisite that she was unable to bear any weight upon the affected leg. Examination showed that the frog had become under-run with pus and that the region of the fetlock was very badly swollen. On removing the frog a relatively large amount of pus escaped. The foot was trimmed out, cleansed and bandaged in a bichloride solution, the application of tar, however, being omitted. The owner was directed to give notification of any further attention seemed necessary. Evidently not being satisfied with the way the foot was doing, and probably largely influenced by outside opinions, the owner had the bandage removed and a cow-manure poultice applied to the entire foot. Within a few days after this a telephone message was received to come immediately, as the horse was very much worse. The symptoms showed a well developed case of tetanus or lock-jaw, from which the horse died in two days. Tetanus is not frequent in this locality, and the clinical history would seem to support the theory that the wound was inocculated with tetanus becilli contained in the dirt and filth of the cow-manure poultice. This furnishes one reason, and a strong one, for absolutely condemning the use of such a poultice.

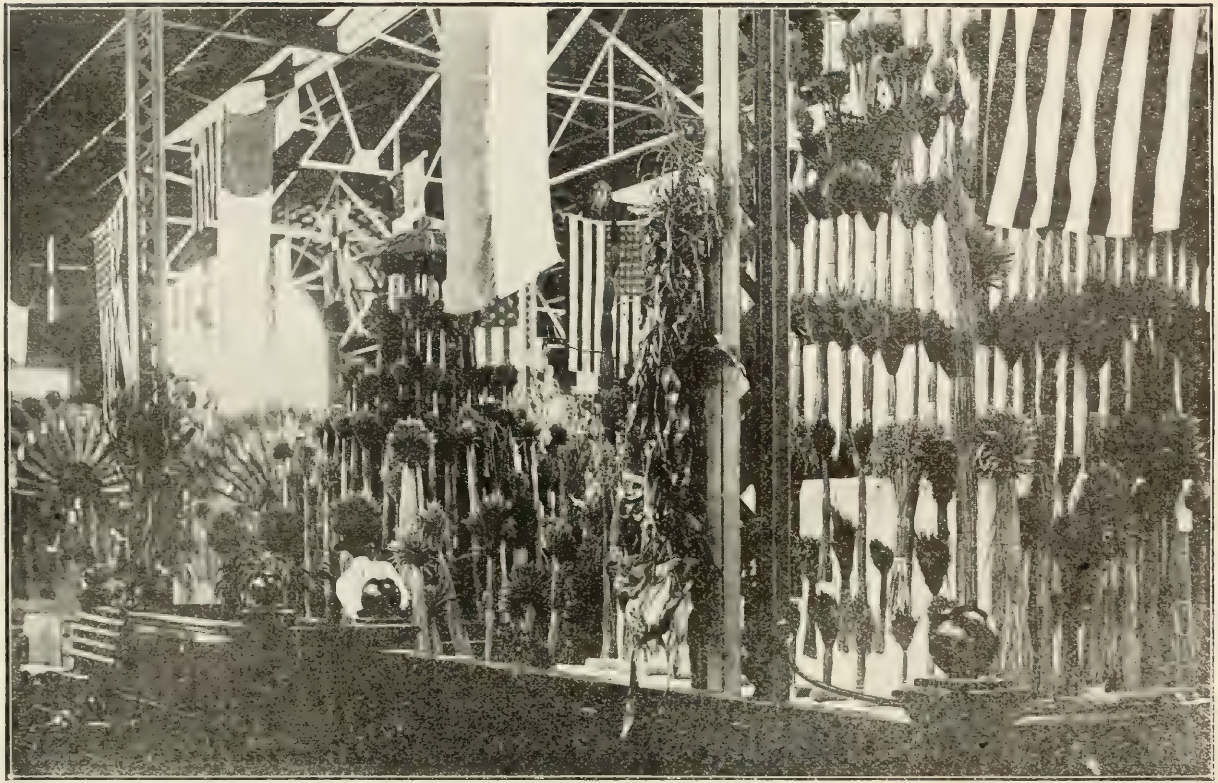
Case C.—An incomplete history prevented accurate knowledge being obtained as to the nature of the injury in this case. The horse had been lame, but subsequently had made sufficient recovery to permit of his being again put to work. The owner had made an examination of the foot, but had been unable to detect anything wrong. The horse had been used for hauling grain to town on a Saturday, and according to report went but slightly lame. Later he became excessively lame, being unable to bear any weight on his leg. He was loaded on a wagon and brought to the hospital on the following Tuesday. It was found that the foot had suffered an injury and that the entire sole and frog had become under-run with pus. After placing the horse upon the operating table the foot was thoroughly washed with soap and water and all of the horn covering the bottom of the foot was removed. After being cleansed in a 1-500 solution of bichloride of mercury, the foot was bandaged and coated with tar. He was then removed to the hospital, and after-treatment consisted solely in the daily application of a bichloride solution at the top of the bandage. In ten days the bandage was removed and the foot dressed with equal parts of tannic acid and iodoform and the patient discharged. He was seen again in two weeks, when it was found that for the most part new horn had formed over the bottom of the foot, the only exception being at the buttress, where there was a slight amount of pus. The foot was dressed with powder as before, and from this on recovery was uneventful.

Case D.—A bay driving mare suffered from a nail prick of the frog, and received no further treatment than the application of a cow-manure poultice. At the time she was placed upder our care the wound produced by the nail was suppurating, and the pus had worked its way upward, discharging by an opening in the hollow of the heel, and another about two inches above this on the posterior aspect of the pastern. The frog and both wings of the sole were removed, and then an incision was made passing from the uppermost opening to the cleft of the frog. Into this was firmly pressed a piece of cotton soaked in the usual strength of sublimate, and cotton and a bandage applied as in other cases. By means of a syringe a 1-500 solution of sublimate was introduced at the top of the bandage twice daily. In addition the mare was placed on dram doses of calcium sulfid twice daily, as there was some fever. In a week the bandage was removed, when it was found that the wound presented a perfectly healthy appearance. A sublimate bandage was again applied and left in position for another week. The foot was then dressed in the usual powder, the application of which was repeated twice. The wound made complete recovery, although the mare remained lame for a considerable time thereafter.

Case E.—This horse was used on a delivery wagon, and stepping on a piece of glass, sustained a transverse cut across the frog, penetrating the fleshy frog. A poultice had been applied as in the preceding case. Later the owner made some attempt at asepsis by bandaging the foot in bichloride solution, but since no provision had been made for the escape of pus by cutting away the frog around the edges of the wound, consequently there was no improvement in the case, as the pus continued to burrow between the horny and the sensitive frogs. Treatment in no respect differed from the methods already described, and recovery was both rapid and satisfactory.

Case F.—A two-year-old stallion was reported lame from thrush. On seeing the patient he was found standing, resting the right hind leg with the foot flexed. Not having any instruments, the foot was simply picked up, inspected and palpated with the hand. There was every evidence of thrush, and the diagnosis seemed to be sustained, since there was marked pain on pressure over the base of the frog. The owner was directed to treat for thrush. In about a week word was received that the colt was not doing well. At this time he was unable to bear any weight on the leg, and there was some swelling around the pastern and fetlock. Previous to this a farrier had been called to examine the foot, but had been unable to detect anything wrong with it. The bottom of the foot was pared with the hoof-knife, but in spite of the most diligent search no trace could be found of any injury. Examination of the rest of the leg failed to reveal any cause for the lameness. Recalling the adage previously quoted with reference to the necessity of a thorough inspection of the foot in all cases of lameness, it was again subjected to the hoof-knife, since the hoof-testers failed to reveal any sore point. After again paring the sole a place was found which yielded more than normally to pressure. A little more paring with the knife and pus escaped. From this on it was a simple proposition and differed in no respect from the cases already cited. All under-run horn was removed, the foot cleansed, bandaged and coated with tar. Recovery occurred so satisfactorily that the patient was not seen again. This case especially illustrates how readily one pathological condition of the foot may interfere with the recognition of a second, should the latter be not so self-evident.

To this record of cases could be added several more of a similar nature, but they would be but a repetition of the preceding. Sufficient have been cited to show how dire may be the results if such injuries are neglected or treated in a manner that departs one iota from the principles of asepsis; and how such injuries to parts naturally subjected to infection can be treated satisfactorily and with a minimum amount of attention.



An artistic display of Grains, Seeds and Grasses. Iowa State Fair, 1905.

PART VIII.

PAPERS ON

Live Stock, Agricultural and Miscellaneous Topics

FROM BULLETINS, AGRICULTURAL PRESS AND
PAPERS READ BEFORE FARMERS'
INSTITUTES IN IOWA.

A---Regarding Cattle.

FEEDING AND FITTING PURE-BRED STOCK FOR SHOW AND SALE

By J. F. Stoddard, Burden, Kan., at the Kansas Improved-stock Breeders' annual meeting, January 9-11, 1905.

It makes all the difference in the world how you are going to get together a show herd, whether you are going to purchase it or breed it. It is an easy matter to select a good judge and let him scan the programs for the exhibit, and send him out to buy a herd of stock for show. Almost any one could get up a good show herd if he would do it in this way. But there is another way, and that is to breed your own cattle. I have a great deal of respect for a man who will breed and show his own cattle. I very much prefer that way. I think that is the showman's mission.

There are a good many requisites in order to be able to do this, and I think the most important one is the selection of the sire at the head of the herd—the one that is to beget the calves that you are going to show. There are very few bulls that are able to beget a very large percentage of show calves, and it is only by going into the very highest-priced ones and those of the very best breed, and those that have the very best pedigrees behind them, that one will be able to do this. A sire that will get even a very small per cent. of show calves is of more value than the ordinary farmer will think he is.

The next thing is the selection of the herd that you are going to show. It isn't an easy matter to look at a lot of calves and tell just which ones are going to feed the best and come out and develop the best. Any one who tries it will meet with a great many disappointments. We get our eyes on them and think they are just what we want, and perhaps in a few months they lose their form, and we have to select something else.

Care should be taken in breeding, so that the cows will drop their calves from the 1st of September to the middle of February. This gives you an opportunity to fill both the senior and junior classes in the show ring. The senior class is composed of calves that are dropped from the 1st of September to the 1st of January. The junior class consists of calves dropped any time after the 1st of January. It is well to have a large proportion of calves dropped between those dates. It gives you a large lot to select your calves from. After they are sixty or ninety days old we should know just exactly what we want to put in the show ring, and if the dam isn't giving all the milk they will take, a nurse-cow should be provided. It isn't at all easy to give them this increased supply of milk. It should be done gradually. I have known some very promising calves to be practically ruined for show purposes right at this point. In the meantime, they ought to take a mixture of feeds such as we give, and then they are getting milk from two cows and two feeds of grain mixture per day. They also have all the alfalfa hay they want and soon learn to eat a little of this feed. From this time on until they are eight or nine months old they are carried along in just this way, but perhaps sixty or ninety days before they are shipped out to the shows they are given an extra feed. We give them three feeds a day instead of two, adding one feed at noon, until they are twelve months old. If they are doing well, they should be gaining about a hundred pounds per month, so that when they go into the show ring, in September, all the way from ten to twelve and thirteen months old possibly, they should very nearly weigh a hundred pounds per month. Usually the best of them weigh about that.

About the 1st of June, when the sun is hot and flies are bad, we take them up and keep them in the barn and stables during the day, letting them out at night. My own practice is not to let them have any green feed at all after this time, but keep them in dry lots and feed them roots, which take its place. They do well on these. The older cattle are provided with good, running box stalls and plenty of bedding. We always give our show stock plenty of good bedding.

During the last two or three months before we go into the show ring there is a good deal of time and a good deal of labor expended in training the calves to show themselves, so that if they are placed in one position they wil stay there. And it takes a good deal of patience and ingenuity to accomplish this. It is a hard matter to find out just which is the best way to handle the calf to make him show himself.

Perhaps ten days before shipping out for show the horns are dressed down and a little grooming commenced. If they are cared for properly their coats should always be in condition to respond to the grooming easily The oil will be there and will come out nice and handsome the first time you groom them. We do very little with the currycomb, using mostly a brush and an oiled flannel rag, which takes the dust out of the hair.

Now, who does all this work? It sounds very easy to do this with just a few head of cattle. I have known many a show herd to go into the ring and lose prizes for lack of somebody competent to do this work. I do not think any man who owns a farm and has to attend to business of that kind can atend to his farm or any other business and take proper care of his show herd also, so that he can go into the Royal or International or Wold's Fair and win. I doubt if it can be done. Therefore, one of the important things is to find somebody who knows how to handle these cattle and handle them to the best advantage. He should give his undivided attenion to it. The next year, after returning from the shows, we know pretty well which are our good calves. We, perhaps, want to carry over one of the bulls we have been showing in order to show a young herd the next year. We select him and carry him on, and if he seems to be a particularly good one we propose to keep him for the next year. That is sometimes done, but not always. Perhaps it is not in the majority of cases. We handle the heifers the same way, although it doesn't seem to be necessary to give the heifers the same or as much attention as the bulls receive. We follow the same rule the next year in selecting our calves.

Some three or four years ago, when I first thought I would like to be a showman, if I had been called upon for this paper I think I could have told you everything there was in the business. My experience in the meantime has led me to believe I know very little about it. The question is often asked, will these cattle breed—are they serviceable cattle? So far as my experience goes, we have less trouble getting our show cows to breed and to drop calves safely than the other cows in our breding herd. It is not usually so considered, I believe, by most people, unless they try it. But the reason for this is generally in the care of the cattle, or, rather, in the ration they eat. I do not believe it possible to keep a cow in a barren stage by the use of plenty of good alfalfa hay and the mixture such as we use in our feed. We use corn-and-cob-meal and bran and oats, about one-third of each. If there is any one part of that ration that runs short of the one-third, we try to make it corn-and-cob-meal. We have used some oil-meal. We used a little of it last year, but not very much, and I cannot say whether or not I will ever use any more.

As to stock foods that so many people use, I have never used but one kind, and that for only a very short time; and as for myself, I do not think I shall ever use any more of it. They are high-priced, and I don't believe they are accomplishing as much as some people claim for them.

No doubt some of them have a great deal of merit, but most of them are simply claimed to be something to stimulate the appetite, and a good healthy animal doesn't need his appetite stimulated. But if it is necessary to do something to restore the animal's appetite, and a little stock food at that time seems to be the right thing, I think that is where it should be used.

My subject said something about sale cattle as well as show cattle. The problem is very much the same as with show cattle. We use the same mixtures in preparing them for sale. The cows and heifers get, perhaps, sixty days of special feed, but the bulls are fed, you may say, from the time they learn to eat until they are sold.

DISCUSSION.

WILKIE BLAIR: Do you ever have any trouble with the cattle's feet getting sore?

MR. STODDER: I had but one case, and I always thought that was due to an injury of some kind rather than to feeding. I don't stable these cattle, perhaps as much as you might think. They get a good deal of exercise. The only time they are tied up is in summer, when the flies are bad, and then they are allowed to run loose at night.

WILKIE BLAIR: What kind of floors do you have?

MR. STODDER: I have board floors, but I use a great deal of bedding. There has been much trouble along the line the gentleman speaks of, but I have had very little of it; in fact, but the one case.

WILKIE BLAIR: You say do not let your cattle out on grass, but feed them roots instead. I can't see why the grass isn't better for them—a good deal cheaper and much handier than the roots. I believe it is a good plan to let cattle run on grass in the night and keep them in during the day. I believe they will do better than to be in a dry lot. You also say you do not groom them until about ten days before show time, and feed no oil-cake. I don't understand how you can keep them in good condition without grooming or oiling them. You may have a secret way of doing this, but I find it hard work to keep their coats in nice condition by grooming them all the time and feeding them oil-cake.

And another thing, I think the best part of the ration is the ground oats. I believe that will do more to keep an animal in fine condition than any other food.

MR. TOMSON: I believe Mr. Stodder covered pretty thoroughly the best methods of handlng show stock. I rather disagree with him, though, about keeping them on grass. We keep our cattle on grass until a short time before the show, but this is a matter of difference in the nature of cattle. Some are inclined to graze too much at night.

Oil-meal we have fed very little of, with no very satisfactory results. A good many cattle are inclined to dislike it. As to improving the coat, it does perhaps for a short time loosen up; but if they are in good condition, the hair is always loose and pliable, and oil-meal has a tendency to make the coat deaden instead of slicken.

As to sore feet: It is a common complaint among show animals, but I think it is largely due to lack of cleanliness. If you use plenty of bedding and have it moist, when they cannot keep their feet moist by going out in the field, use a little water or use some disinfectant. I do not believe you will be bothered.

One thing I think possibly Mr. Stodder might have said more about—I apologize for his statement that he was not prepared; he learned that in the show ring; they never are prepared there—about feeding sale cattle; I think this is one thing that causes perhaps more loss to breeders of pure-bred cattle than anything else—cattle for auction as well as cattle for private sales. A great many of them graze their cattle until about a month or two before they want to sell, and then put them in lots and feed them all they want, instead of feeding them carefully; and as a result they sell them to people who take them home, and they go back to ordinary former treatment, and get out of condition and give poor satisfaction; and purchasers begin to feel that there is something in good condition that is not serviceable, and this is a mistake. Cattle should be put on dry foods gradually from weaning time so that they hardly know when they have been put on dry food; they will do much better.

O. O. WOLF: When a nurse-cow is used, is the calf allowed to stay with her during the day, or is the nurse-cow tied up and the calf allowed to be with her only a part of the time?

MR. STODDER: My practice is always to keep the nurse-cow and calf separate. In the evening when the cow comes in she is given a small feed of grain, the calf is allowed to nurse at night and at no other time and in no other way. They soon learn, both of them, to know just exactly what is coming, and both seem to do well under that treatment.

JOHN PECK: Do these people who provide nurse-cows see that these cows are highly bred, or are they beef cows or dairy cows?

MR. STODDER: If the gentleman would go into some barn, where nurse-cows are provided, I think it would be necessary to ask that question. I think I have seen some of the meanest looking old "pelters" there that I ever saw anywhere. What we want is a cow that is a good milker, and that is all we want.

C. F. STONES: I think Mr. Stodder has told us some things os especial interest in regard to show cattle. In the first place, I am going to answer the question in regard to sore feet and their causes. The first reason is carelessness, and failure to properly take care of them in their stalls, and the second cause is just simply pure carelessness on the part of the herder.

The next point is in regard to the roots and grain and grass; they are a separate food, and the cattle have got to have such in order to put their digestive organs in proper shape to make use of other foods, and my preference for dairy breeding is grass. I think there is nothing like grass. Cows may be inclined to eat a little too much grass and eat less in the stable in the morning. In such case, I think the root would perhaps be preferable.

When Mr. Stodder speaks of breeding one's own cattle, he knows well enough that the pure breeds have got to be bred and shown by the same man. The managers are compelling us to do this. I would much rather go to my friend, Mr. Westbrook, and buy a two-year-old colt of him that he raised, and, after I got it, if I found something I didn't understand about it, I could go back to him and he could tell me about it. The same way with my friend, Mr. Robison. I would rather go to him and pick out a horse or colt that he has bred than have him import one from a long way off. If I were going to get a nice piece of beef, I would go to my friend Stodder; he is one of the best beef-breeders in this state.

PARKER PARRISH: I always turn my cattle out at night from the time we start out. I have been feeding oil-meal, but I think it is doubtful. But I believe our show herd drop their calves just as regularly and as safely as any cows we have.

O. O. WOLF: Do you wet their coats?

PARKER PARRISH: About three weeks before starting out to show we wet their coats.

O. O. WOLF: It occurred to me that possibly the moist atmosphere had something to do with the growth of hair, because we find all of the cattle in Great Britain have a large growth of hair.

INDIVIDUALITY IN THE HERD.

G. W. BERRY, Emporia, Kan., at the Kansas Improved-Stock Breeders' annual meeting, January 9-11, 1905.

The character of any pure-bred herd depends precisely upon the quality of each and every animal kept for breeding purposes.

The head of the herd should be an outstanding individual. He should resemble the ideal in form and size, be of standard color, and possess all the style, finish and quality possible. He should be the nearest living model of his kind that time, distance and means can procure. The boar should carry great size. The potent sire must be large and have stamina and constitutional vigor. His body should be of good length, well coupled, even and smooth and symmetrical. Combined with great size, the boar must have finish, especially in the head. The boar that will not stand a square look in the face cannot pass. The head should be short, fine, and smooth, and the face broad between the eyes and expressive of intelligence and kind disposition; the eyes open, bright, and clear; ears fine, soft, and silky; jowl full and smooth; neck full and broad on top; shoulders wide and deep, broad on top, compact, smooth, and well down on arm; back of good length, slightly arched, broad, and even; loins full and smooth ribs well sprung from the back; chest large and roomy; rump long, broad, well rounded, and tail set well up, tapering, and curled; hams long, deep, and thick well rounded from points down to hocks; sides long, straight, deep, and clear of wrinkles, and flanks let well down; legs short, set wide apart, and standing erect; the fore legs should stand plumb and be muscled on arms; hind legs strong and hocks well set; pastern short, neat, and firm; hoofs tough and toes close and erect. The boar should be commanding in size, stylish in action, stately in carriage, perfect in symmetry, attractive and imposing in presence. If his qualities are inherited in common from the sire and the dam, he will likely stamp his individuality. He should get both good males and good females. The argument that it is necessary to keep one sire to get good males and another to get good females is ridiculous, untenable, and without foundation.

The sow should be the same type as the boar, medium to large in size for her class, but need not be nearly so large as the boar. She should possess as much finish and more refinement and quality. Her face should be broad and smooth between the eyes, and tapering gradually to the end of the nose. She should have smooth shoulders and straight, smooth side lines, and possess neatness symmetry, and style. She should be kind and quiet in disposition, an easy feeder, and prolific.

The requirements of the female should not be limited to one or to a few individuals. It is similarity or uniformity throughout the herd, indicating a fixed type, that shows the skilful breeder.

It is safe to affirm that the true method of development and perpetuation of "type" is "line breeding."

The questions of "in-and-in breeding" and the extreme "outcrossing," together with confusion of ideas and differences of opinion, suggest a discussion of the principles of breeding—not with the purpose of settling the question with all the mysteries pertaining to it at this time and place, but simply to arrive at a better understanding of known facts.

One of the principles of breeding, old as creation and fixed as the law of nature, is termed heredity. Heredity is the principle which causes resemblance, a similarity or uniformity in a species, and concentrates in the individual the sum and aggregation of all the ancestors. Wild animals in a state of nature are pure examples of heredity. They have been for ages of the same form, color, habits, and character. The quail of to-day has the exact shape of body, color and penciling of feathers that it had hundreds of years ago. The leopard has not changed a spot nor lost any of its cunning in a thousand years. The wild hog is as fierce and fleet as when first hunted in the primeval forest. The tawny lion is as strong and bold and courageous and of the same noble presence as of old.

Opposed to the force of heredity there has been developed another force termed evolution. It is a radical and progressive principle that by selection and different environment unfolds and develops the animal changed in color, in form, in size, in quality, and in disposition, as seen in domestic animals which have been aided and directed by the hand of man. Examples of the principle of selection may be seen in the splendid uniformed and marked Herefords, in the fine qualities of the Short-Horns, and in the sleek Aberdeen-Angus and rich-coated Galloways; and in the beautiful Berkshires and their American cousins, the Poland-Chinas and Durocs; in the ponderous Percherons and Shires, and in the level headed, sweeping-gaited Hambletonians, Wilkeses, Patchens, and McGregors; in the flocks of the golden hoof and golden fleece; in the endless varieties of birds—birds of utility, birds of barred and penciled feathers, birds of gay plumage, and birds of song. All of the distinct breeds of improved stock are impressive examples of the principle of selection.

Wild animals are strictly pure-bred and can be depended upon, in the state of nature, to reproduce their own kind unerringly. Domestic animals, especially those of the improved breeds, which are modified forms of the original, will reproduce themselves imperfectly unless guided and directed by the hand of man. In the formation and development of a new breed the principle of original heredity is temporarily overcome by selection and in breeding and mating certain animals, changing color, form, and disposition, by patterning after the original principle of heredity, until the desired type appears fixed in the family or breed. But there is a continued conflict between the principle of heredity and the principle of selection. The forces of heredity battle for supremacy and return to the original state; the forces of selection rise in arms against a relentless foe striving for advancement, striving for victory. And when good judgment is not exercised in selecting and mating breeding animals, unaided and unsupported by generous feeding and careful attention, the forces of selection are weakened for the want of sustenance and lack of reenforcements; the principle of selection halts on the road of improvement; retrograde movements follow—retreats by the route of scrub ancestors—and development is vanquished.

The breeder who introduces violent outcrosses one after another invites and fosters the very elements that will destroy the result of years and maybe a lifetime, of work and systemtaic breeding. By mixing the blood of animals from different sources he invites a conflict between contending forces; the pattern is destroyed; the principle of selection loses the battle, is captured, and heredity leads the individual back to scrub. This is the result of indiscriminately crossing different strains of the same breed. The result is more marked in crossing two or more different breeds. Pigs by a grade Berkshire sire and from a sow half Chester White and half Poland-China were red, spotted, speckled, and striped, showing that the improved standard type and all of the three respective breeds represented were destroyed, the improvements in color and form lost, and the result was a return of the individual by the principle of heredity to the original scrub.

Persistent in-and-in breeding is directly the opposite of outcrossing. The result of close in-and-in breeding is not so noticeable at first, but is more disastrous to the individual than outcrossing. The mysteries surrounding in-and-in breeding have never been satisfactorily explained. In this discussion it is only proper to consider facts. Through the application of the principle of persistent, close in-and-in breeding, the individual loses form, color and size, to all of which is added the misfortune of weakened vitality. Close in-and-in breeding in Berkshires developes pigs off in markings, spotted about the necks and legs, ungainly of form, with thin quarters, long legs, and weakened vitality and loss of breeding power. In Poland-Chinas, it produces small, weakly, speckled, spotted and striped litters. In Herefords and Short-horns, it develops undersized, big headed, peaked, ungainly, runty scrubs. In some mysterious way, the principle of selection appears overdone or handicapped, and heredity again leads the individual back to worse than the original scrub state.

The value of inbreeding to the extent of fixing and perpetuating a type appears to be settled. And so far in that direction shalt thou approach, but no further, appears to be just as certain. Outcrossing is risky. But there must be an occasional infusion of fresh blood. Toughtful breeders have hit on the plan of keeping tried forces in the majority. Two or three generations of line-blood control one from the outside, and seem refreshed and invigorated by a carefully selected infusion of new blood.

The application of correct principles of breeding, supported by generous provision of feed and careful attention, gave to the forld magnificent herds and breeds of cattle, hogs, and horses, and immortalized the names of such men as Bates and Booth and Cruickshank. It has produced and shown to the world a Richmond, a Cupbearer, a Young Abbotsburn, and a Choice Goods. It has brought out Anxieties, Improvers, Fullfillers, Beau Brummels, Correctors, Beau Donalds, Prime Lads, Keep Ons, and March Ons. It made Tom Corwins, Tecumsehs, Perfections, and Mischiefmakers. It developed a Longfellow and a Masterpiece. It has produced a Cresceus, a Lou Dillon, and a Dan Patch.

The careful breeder will attend regularly to the weeding-out process. Uniform individuality cannot be maintained except by culling out and discarding every inferior animal. If thirty-five per cent, of all pedigreed hogs and cattle could be cut out, and ten per cent. (the tailings) put in the feed lot, fitted and consigned to the butcher, and the remaining culls, or twenty-five per cent., disposed of as grades, such action would elevate the improved breeds of live stock to a high standard of perfection. Such action by the breeders would be in line with the law of selection, in keeping with the truism, the survival of the fittest, and consistent with the declaration that "the best is none too good".

To the young breeder, to the small breeder, to the beginner, I would say: Breed from the best stock or the best your means will furnish, and keep at it; have a purpose; breed to a line; breed a type. Keep at the head of your herd a male that you can point to with pride as your chief sire. Raise him if you can; buy him if you must. Introduce new blood by the purchase of females. Develop your young stock by generous feeding, kind treatment and careful attention. Grow them so well that they will be objects of attraction and admiration. If the number of animals on hand seems unprofitable, reduce the number and raise a better class. Raise as many good ones as possible; the more good ones the better, but have them good.

THE PUBLIC SALE AND THE PURE BRED STOCK BUSINESS.

GEO. P. BELLOWS, MARYVILLE, MO.

(Bulletin Missouri State Board of Agriculture.)

The close inter-relation of the public sale to the pure bred stock business is coming to be very generally understood, as evidenced by the steadily increasing number of auction sales of this class of stock annually being held. The public sale system of disposing of pure bred stock has grown amazingly in popular favor during the last decade. The increase in the number of auction sales during this period has not been the result of a mushroom growth, but has been the natural unfolding of legitimate causes, the results of which have been of untold benefit to the farmer. Since the farmer is engaged in the most important business or occupation known to man, and since the public sale and the pure bred stock business is one of the chief mediums through which the farmer and his calling is to be elevated and dignified as never before, it is plain to be seen that much thought should be given a subject of such immediate importance. The primary thought with reference to this subject is, "The Pure Bred Stock Business," the "Public Sale" being only a means to the end, and, therefore, of secondary consideration in this connection.

The farmer who has at heart the future financial, educational and moral welfare of himself, his family and his children's children, can illy afford to ignore the question—Whether or not he will interest himself in the matter of breeding pure bred stock?

Throughout the corn and tame grass belt of this country of ours the best farm lands have become so valuable,—worth so much money per acre,—competition so close and margins on staple products so narrow, that the farmer who breeds, feeds and markets the low grade or scrub animal, be it horse, cow, hog, sheep, or any one of our better known domestic animals, cannot hope do so and realize above the bare cost of production; indeed, he can count himself lucky if his time has not been given to the running of the machinery of the farm at a loss.

No American citizen should be content in this country, fraught with such wonderful possibilities, to run his business upon the plane of bare maintenance, for, in the great, broad sense of the term, we cannot long stand still but must either advance or go backward.

Should the above proposition be admitted, and we think they must be, then the question of a remedy arises. We will not undertake to say that the pure bred stock business, of itself, is a "cure all" for the multitude of ills which beset the farmer in the management and execution of his business; but we do unhesitatingly assert that the farmer of average intelligence who will earnestly put himself to the interesting and pleasan task of studying the pure bred stock business, and will then gradually and cautiously put into actual practice the sound principles which he may learn from reading, observation and experience, will have taken a long stride toward correcting many of the symptoms suggesting stagnation, unthrift and everything antagonistic to the principles of progress as applied to farming and farm life as a pleasant, dignified and noble occupation.

Those who for one or several reasons have failed to give the matter of breeding pure bred stock any serious consideration and, therefore, have never taken the first step; or those who have concluded because some erratic fellow who had more enthusiasm than sense, capital or experience, failed; it would, therefore, be foolish, if not dangerous, to invest in pure bred stock, will doubtless, and of right should expect us to point out the way in which they can safely start in this business with the reasonable assurance of success to the extent that will bring about financial, educational and moral uplift. To do this to the entire satisfaction of myself will be a task for which I confess my inability, but, nevertheless, I shall always be found willing to contribute my mite toward bringing about the desired results. The class of men with which we have to deal in this connection may be divided into three groups; first are those who are hardheaded, ignorant and will not listen to argument or be convinced even after actual demonstrations have been made; the second group embraces a very large class known as the thoughtless, indifferent, happy go lucky sort of fellows, who rarely give any subject serious or deliberate consideration; then there is the third class which includes the uniformed, but ambitious and willing to learn and profit from the knowledge and experience of successful men who have gone before them. It has been said that, "There are none so blind as those who will not see." It is, therefore, almost useless to spend time in the vain effort to convert the proververbial unbeliever,—the man who without good reason sets his head against progression. In order to exert any beneficial influence upon the class enumerated in our second group it is necessary to make forcible, direct appeals, and this is scarcely ever accomplished except at public sales and by the personal force and logic of the auctioneer who, for the time, may, perchance, have one or several of this indifferent class of people within his influence and, thereby, induce him or them to become purchasers. Even when this is accomplished the chances are that in quite a per cent of instances the new convert will revert to his original shiftless, indifferent habits and, as a consequence, little ground will have been gained, because, as in all other businesses, the breeding of pure bred stock to be successful requires studious habits and a willingness to give attention to, at least, the details of ordinary care and management. It therefore remains for us to conclude that a very large majority of the new recruits in the future great army of improved stock breeders must come from the third or last class of individuals herein referred to. To the majority of men "money talks," therefore one of the first things to be done is to convince the unconverted farmer that by discarding the scrub, grade or nondescript sire and by placing him with a good and carefully selected pure bred he will thereby be money in pocket instead of out. That such is the case is no longer a theory but is a fact being demonstrated in every enlightened community, also at the live stock markets of the country on every business day of the year.

Every business that permanently succeeds must rest upon a broad and well grounded foundation. No business is more permenent than that of farming because the entire population looks to the farmer to be both fed and clothed. The farmer operates the machinery supplying the raw material which furnishes the world with all of the necessities, also a multitude of the luxuries of life. With this responsibility, never ending demand and unsurpassed outlet for our products, we have not to consider so much the finding of a market as we have to give thought to economical and profitable production.

Taken collectively the farms of America, in point of value and productive importance, outrank all other manufacturing institutions combined. Among the manufacturers of commercial commodities vast sums of money are wisely spent in the investigation of questions and principles, the application of which will reduce the cost of production, raise the efficiency of the article manufactured, and also to perfect the question of the distribution of the finished product with the greatest economy. This work has been carried to a wonderful state of perfection and when the time comes, if it ever should, that even one-tenth of the intellect and capital is spent in the application of real, not imaginary, economical principles of production with reference to the farm as a manufacturing institution, then our country will bloom as a rose and the scrub farmer and the scrub animal will be a vanishing species.

Live stock farming,—by which is meant keeping live stock on the farm, —is, and in the future will be, the only safe means of maintaining the productive qualities of the farm manufacturing plant. Without live stock the capacity of the farm plant is annually decreased because of the inability to return to the soil the fertilizing elements required to sustain the maximum limit of production. Some will doubtless say—"What has all this to do with the pure bred stock business, as the scrub animal will return as great an amount of fertilizing element to the soil as the pure bred?" This is true, but where the pure bred, or high grade, excels the scrub in his ability to consume the grain and forage crops of the farm, and, as a machine, most economically convert them into a product for which there is always a demand for the best at top market values. Experiment station work, market reports and the practical experience of our most intelligent and successful farmers, breeders and feeders, as well as expert buyers, packing house owners and conveyers, are all on the side of the pure bred or the high grade animal as being consistent money makers on the farm. The above argument applies to the production of the commercial products in its live state and forms the basis for our contentions with reference to the advisability of making the breeding of pure bred, recorded stock a part of our farm business.

The fact that it requires the pure bred or high grade animal to acquire the results above mentioned argues the absolute necessity of the perpetuity of the pure bred animal for breeding purposes, else, in a very few short years we will find ourselves scarce of this vitalizing material. The natural tendencies of all improved animals and plants are to deteriorate unless cultivated and given congenial environments and opportunities for improvement and development. Man himself is no exception to this rule. The truth of these statements points the moral that there will always be a demand for pure bred breeding animals such as will insure the producers of the good kind a profitable market. But, I fancy, someone inquires, "Where does the economy in breeding pure bred stock come in?" Speaking from my own experience and a very wide field of observation I can say that the farmer who breeds and grows pure bred animals, taking as a basis the average of the sales the country over, realizes from two to ten times as much per head for the surplus product of the herd, the relative increased amount depending upon the quality breeding, condition, etc., of his animals, than does his neighbor farmer who breeds common stock.

Then I would ask: "Is it not more economical to shelter and feed one animal that will do the work of from two to ten, than it is to house and feed the larger number? We say yes and can point to innumerable instances to prove the assertion. Now as to the educational advantages to be derived from keeping pure bred stock. No sooner is the first pure bred animal placed upon the farm than the educational influences are set to work. The neighborhood gossip is at once turned to something better and which stands for improvement. The local paper, if it does its duty, announces the advent into the community of an animal of improved breed and type. As a result of all this the owner and his family begin to realize a degree of pride in the fact that it has been imposed upon them to be leaders instead of followers in their community. In order to maintain this enviable and commendable position they begin to read up and keep themselves informed with reference to the history of the breed, its ancestry and other matters pertaining to care, feed, management, etc., to the end that that their life and vision becomes broadened by being brought into touch with progressive movements of the times.

Soon the agricultural college and the courses in live stock husbandry are learned of, finally the son or father or both, takes advanatge of the short course in live stock judging and thus a new world is opened up. After that fairs are attended and the awarding of prizes is watched with awakened interest. By this time our candidate is associating himself with the best class of men, whom he finds congenial company because they are sensible and willing to give information, gained from the field of experience, which, to the young man or beginner seeking knowledge, is invaluable. A public sale is attended and here, to, a new field is found for observation and instruction. By this time the breeding of pure bred stock is a subject that has taken hold of the family and has not only been the means of broadening their views of life, but has also brought them into prominence as progressive people, and soon the sons and daughters are in demand from those seeking to employ young men and women of good families to fill responsible positions of trust at remunerative compensations. The sons and daughters from such families also invariably enjoy superior advantages when it comes to the matter of selecting a life companion and thus the educational influences arising frmo the first start in the pure bred stock business goes on and on from generation, wielding an immense influence for good in their own immediate community and to society in general.

The improvement of one's moral status, as well as the educational advantages obtained from breeding pure bred stock, is also a matter worthy of consideration. The more nearly one's time is occupied in studying questions relative to any form of improvement, the less time they have to devote to the trivial non-essentials of life. One of the first things to be learned by the beginner in the breeding of pure bred stock is that all future substantial success in the business depends upon his standing and reputation as an honest man. Absolute and unqualified honor is an essential requisite to success in this business, because a man's word and representations are the only guides we have as to the identity of his stock and the reliability of their breeding, age, etc. If it is once learned that a breeder has misrepresented the age, breeding, or anything pertaining to record of his stock, he soon loses caste and is viewed with suspicion thereafter. Thus it is that a man's moral status is given additional impetus and support after he has engaged in the breeding of pure bred stock.

Fearing that this article will be too long we will but briefly refer to the "Public Sale" feature of the subject. The "Public Sale" along with the agricultural press, the agricultural college and public exhibitions of fine stock is exerting a mighty inflence both in an educational way and in the distribution of such stock. Many a farmer attends a public sale and secures his first impression of the vital importance of breeding improved stock. Here he learns by way of actual demonstration that it is profitable to breed and sell pure bred animals for breeding purposes. In this way the well informed, intelligent auctioneer is in position to do much good and be of advantage to both the buyer and the seller. I have heard prominent breeders declare that they had received some of their most valuable lessons from attending public sales. There was a time when the public sale was looked upon with suspicion, but that time, I am thankful to say, is passed and today no business is run upon a higher plane of business ethics than the selling of pure bred live stock by auction. As a convenient and satisfactory means of disposing of one's surplus stock, or for closing out one's business, the public sale has come to be recognized as being indispensable.

How to conduct a successful public sale, when and where to hold it, how to advertise, when to begin to condition the stock for sale, just the kind of a catalogue to issue and when it should be out, the auctioneer to employ, how to entertain your customers sale day and various other questions are each subjects which might be considered at some length, but they are outside the legitimate limitation of our subject. In conclusion I will say that, in my opinion, the inter-relation of the public sale and the pure bred stock business will, in the future, grow stronger and become more potent for good alike to the breeder, buyer and the public in general.

STARTING IN PURE-BRED CATTLE.

S. R. YOUNKEY, BOONE COUNTY, INDIANA, in Breeders' Gazette.

On Sept. 14, 1900, I bought a Hereford cow, with heifer calf at foot and bred again. On March 26, 1901, she dropped another heifer calf. I then bought a registered bull and began breeding Hereford cattle. My herd has increased so I now have 13 head from the two purchases, having sold one bull calf in the meantime. I sold the bull first bought and replaced him with another.

It takes but a short time to establish a herd of cattle by starting in a small way. My first calves were females, which was very fortunate.

As to profit, I think that after the first purchase price is paid, it costs no more to raise these good cattle than the common kind, and if they cannot be sold at satisfactory prices for breeders I can always get the top prices in the market; the pedigree will not taste on the beef.

I intend to build up a herd of registered cattle by replacing grades with registered ones as fast as I can produce them.

As to the $30,000 proposition, I think it unnecessary. I do not own a foot of land and my cattle help to pay the rent. If more farmers would breed pure-bred cattle in a small way and sell the surplus to be slaughtered our country would have more wealth and so many market reports would not read: "Not enough good cattle to go around." Besides it is more pleasure to have a herd of cattle uniform in make and markings than a herd of mostly scrubs.

GOOD CATTLE ON GOOD LAND.

JOHN MEHMKEN, DES MOINES, IA., in Breeders' Gazette.

Somebody started the cry, and editors of certain farm and market papers keep on like so many parrots telling us, that land is getting too high to keep cows for the purpose of raising market cattle in the Corn-belt, and it is refreshing to read such editorials as appeared in THE GAZETTE Nov. 30, "A Money-making Herd on the Farm" and "Good Cattle and High priced Land" in your issue of Dec. 14. In my opinion it is just as safe as ever to keep good breeding cattle, providing they are managed right and calves are fattened to be marketed as yearlings.

In 1903 a neighbor fed a load of Hereford calves and one day I went to look at them; coming back I was asked by another neighbor what the cattle would weigh and my answer was eleven hundred pounds . He looked surprised and said: "I don't mean his two-year-olds; I mean the calves." "Well, that was what I meant, too." They went to market a few days later averaging not quite 18 months in age, crossing the scales at a little over 1,100 pounds, and sold in Chicago for 5½ cents per pound in November, when thousands of older cattle with little or no more weight sold from 4 to 5 cents.

If every breeder of pedigreed cattle would encourage breeding more and better calves in his own neighborhood by selling his young bulls at living prices rather than keep looking for somebody to come and take a few at a long price and steer the rest, if must be, he would not only help his neighbors but the trade of the rangeman also, who brings his calves to the Corn-belt, and in turn will take good bulls with him, and so help the breeder. It may sound odd to advise breeding of more calves in the Corn-belt in order to help the trade of the rangeman but neverthless it will have that effect. Panhandle calves find their way into the Corn-belt more and more, slow perhaps but sure, and if buyers will take the fat yearling as readily at good prices in future as they did last season progress will be made much faster.

Reading your article about "Panhandle Calves in the Corn-belt" in your issue of Nov. 16, last and reports of sales of such calves, it appears to me that Frank Hastings, Judge Nelson and others, while thankful for what progress they are making in gaining new territory for their calves, are not quite satisfied with the result of their late sales and seem to be wondering why feeders are discriminating against heifers and small steer calves.

I have studied the situation a good deal and argued with many a feeder on the merit of fattening calves from a herd of over 60 head of breednig cows and heifers as well as feeding a bunch of Hereford calves at present, together with some yearlings, and have learned many details, which in the nature of things are not easily discovered by a rangeman, even if he visits the Corn-belt farms with open eye and ear in order to learn how to improve the trade. I shall be glad that if what I am going to say may benefit these men in any way, more so, because they are not mere traders, who lose all interest in the cattle as soon as sold and paid for, and we should work in harmony.

Panhandle men have gone as far as present conditions seems to justify in bringing their calves to the Corn-belt, but to meet success in full it seems to me they stop just a little short and as they get better established, they will find it to their advantage to bring them to the feed-lot. Men who raise good beef calves in the Corn-belt are generally proud of them and it is their natural desire to even up in number to make a carload of beeves, and if they can buy just the kind and number wanted at their home station they will not begrudge a dollar or so per head, but this same dollar may mean the profit or loss in the transaction to the rangeman.

Comparatively few men are situated to feed a carload of calves, or say 50 to 55 head, but many would be glad to have 25. Yet they feel that on business principles they cannot go far for that number and pay full car rate to get them home, besides traveling expenses. I have been convinced of these facts ever since I attended one of Mr. Sotham's sales in the fall of 1902 and today I am more certain than ever that bringing the calves to the feed-lot will be the shortest road to success. I have seen many obstacles in the way also, but they are disappearing fast.

Calves can be raised wholesale fashion on the range, but baby beef is not the product of the big feed-lot, as calves seem to thrive best in small number (another factor to be reckoned with.) Advice has been given for two neighbors to buy and ship a load of calves together and this plan has been tried and found wanting when it came to divide up, and after all there is the extra haul for the railroad to be paid by buyer or seller directly or indirectly, which can be avoided if calves are sent to different localities instead of to central places in the Corn-belt. It is not surprising that the big early calves are taken more readily at auction than smaller ones because feeders reason thus: the small calf is either out of a young heifer or it should have had its mother's milk another month or so, and the chances are in both cases that he always will be undersized. It is not only because packers discriminate against heifers to a varied extent that we must buy them lower than steers of the same quality and weight, for if we shelter them together with hogs in winter they are often injured by the latter tearing their sexual organs which always gives more or less trouble and if we keep hogs out the droppings will go to waste. The worst draw-back, however, comes in early spring when heifers come in heat and it takes close watching to sort out such as are thus affected, and gains at these periods are small if any. The best way is to breed them two months or so before marketing, but the bull should be kept in the pen and the heifer brought to him, and kept by herself after service for a while. This is better than spaying if the heifers are fed as yearlings.

A year ago last fall one of my friends went to the Panhandle on my advice to buy a load of calves; he brought home 60 heads of heifer calves which he put on a grain ration at once. They made excellent gains all winter and he was told such calves would not come in heat, but the unexpected happened and began with a few of the larger ones. He thought it wise to buy a bull calf and turn him loose with them; soon he found he had to have a second bull, and in time a third one was necessary. The young things were not sure and it was a costly lesson; nevertheless they all were settled at last and a grand bunch of calves they were when I saw them in June.

If baby beef is made for the spring and early summer market the heifer calf is more resireable than the steer, as she finishes quicker and even if not quite finished will relatively sell better than the steer in the same stage of finish and she can thus be got out of the way before the rush of work sets in.

The 80 to 160-acre farm on the level prairie with good buildings and a careful master should be the ideal place for the making of baby beef, especially so of heifer beef. As a rule such farmers grow good crops of corn, oats and clover hay, which together form a good ration for calves and if some corn is cut and perhaps shredded and oat straw fed there is an abundance of good roughness as well as variety. This class of farmers have but little work in winter and can take care of some calves and hogs very nicely, and if they lay in good-sized calves early in the fall they can have them on the market in April or May, when as a rule light fat cattle sell well. If the prairie farm is the ideal place to make baby beef it is not the only place; on the contrary the more rolling ground has advantages as well.

J. G. Imboden says: "Waste nothing in feeding roughness by giving more than they will eat." This may be applied where no other cattle are kept than calves, but if a breeding herd is kept it is better to give calves plenty of roughness, and let them eat a couple of hours in the morning, then turn them into another lot and let the breeding herd follow the calves to clean up; feed calves in the other lot and again change at night; thus the calves always get the best and the cows will keep mangers and troughs clean and sweet. At present the two-year-old steer claims the right to be fattened on the rolling ground, which has generally lots of fall pasture to be eaten, also stalk fields to be cleaned out after husking, and if the corn should fall a little short, it can be bought on the nearby prairies at market price to be delivered. The two-year-old steer does this cleaning up with much satisfaction and profit to himself and sometimes to his owner, but a calf intended for the feed-lot cannot lose time in the stalk-fields. If good breeding cows are kept in place of aged steers they will clean the field while their calves are weaned and afterwards will follow the calves to clean their troughs and mangers and by so doing go through winter in good shape to bring forth a new crop of calves, which will fill the feed-lot again when the former crop goes to market.

As long as Corn-belt farmers can afford to let untold tons of first-class feed go to waste by not cutting their corn there is little danger that a man who cuts most or all of his crop for feed will get hurt financially if he keeps a good breeding herd for the purpose of producing calves fit to be finished for the market as baby beef.

HOW CAN CATTLE AND HOGS BE MANAGED TO MAKE THEM PROFITABLE.

Discussion by ABE ROE, before Mahaska County Farmers' Institute.

Take it fifteen years ago this subject cound be handled very easily, but with our increased price of land we have got to be very careful in order to make interest upon our investments. I will take as an illustration a 160 acre farm, and as all successful business men have got to lay a foundation or we cannot be successful, just so with the farmer. The farmer has got to lay a foundation in order to be successful. I will divide this farm or land into fields as follows: I will divide it into four thirty acre fields. One 25 acre field, one 10 acre field and one 5 acre field. I will use the five acre field for my buildings, orchard, truck patch, feed lots and garden.

I will take up now the hog proposition first. I am a little better acquainted with that than the cattle proposition. In the first place I will use the ten acre field for meadow. I will use the twenty-five and thirty acre field for pasture, and I would aim to have my pasture about half red clover. We have a white clover but I would aim to have it red clover. Now, we as farmers, know about two years is the life of our red clover. The way I would do that, in the spring, of the year when the frost has dried the ground sufficient and the sun has dried the ground sufficiently, I would run over that ground with a disc harrow set at an angle of twenty or twenty-five degrees and follow it with clover. I would then follow that with a smooth harrow so as to give me a good seed bed; and then by the time the timothy and blue grass is large enough to turn the stock upon it in the spring the clover would be sufficiently rooted so the stock would not stamp it out. Another thirty acres I would sow in oats and clover, sowing the clover in the proportions about one bushel to seven or eight acres. Before I sowed my oats in the spring of the year I would take them to the fanning mill and I would fan out one-half, and I would take the small seed, using nothing only the large grain. One reason it will give you a larger yield and another reason it will give a strong straw and stand up against a heavier wind. The other land remaining I would use for corn. I would pulverize the soil as fine as I could get it, so if we had a dry season the soil would retain the moisture as much as possible. I would be careful in selecting my corn, would examine the seed to use the best germinating corn. About the first of May, I would regulate the drop of the corn planter by the size of my kernels of corn. I always prefer three, and then I would not be afraid of the weather killing my corn. I have not had for a number of years a poor stand of corn. Good seed, that is thoroughly dried, never allowed to freeze, will bring forth a good strong sprout and that will give you under ordinary conditions a good strong stalk and likewise a strong ear.

Now I would aim to keep about six or eight good heavy brood mares of the draft type, on the farm. I would raise as many colts as I could and at the same time use those mares to do my farming, and whenever I saw

I was going to be over stocked with those colts, in the fall of the year I would get them in the best condition I could and then I would sell them. I would aim to keep a number of good milk cows. I would arrange to have one-half of them fresh in the fall and one-half in the spring so as to have as much milk as possible all the time for my hogs and other purposes.

I would build a good hog-house, have the doors open front the south to get the sunshine when I needed it; then I would build a good floor, lay it out of brick, around that brick feed floor I would build a fence, a tight fence at least four feet high. I would have a door in each end of it so I could put my feed in there, let it be corn or slops, without having the hogs in there until I had my feed ready, and then I would let them in together. I would keep sixteen brood sows; have them farrow along in April. First, I would feed nothing but corn and water, and then feed slops. I would arrange a feeding-place whereby the small pigs could run away from the mother; I would fix a low, flat trough and put in milk where these pigs could learn to drink milk; a little later on, would mix their milk with red shorts and soak the corn, and turn my sows upon pasture as early as I could. I believe in the brood sow having all the grass she can get. I think the grass is the best thing for her, and I would continue to soak shelled corn until after harvest, and when the oats are taken off I would turn my hogs in on the clover. Right here permit me to say, I would sow the clover at the same time I sowed in the oats, and put the clover in as deep as I put the oats in. I have practiced that for ten years and have not had a failure during all our dry seasons and wet ones likewise. As soon as new corn is fit to use I would commence lightly feeding my shoats on new corn, and as I increased new corn I would decrease old corn until I got them on full feed on new corn. I would carry them along in their winter quarters until February or March I would be regulated by the price at that time. Those hogs ought to weigh in the neighborhood of 1,500 pounds. Ten brood sows ordinarily have taken care of and raised about 100 pigs; that is what I count on; those 100 pigs or hogs weigh around 300 pounds, and if we get four cents a pound they will bring us $1,200; if we get five cents a pound they will bring us $1,500. Our colts that we raise that season will be good money to us; our calves that we raise up until they are large enough for the butcher for veal will bring good money. I would put the calves to the butcher if I was not raising them for beef purposes; then we have our chickens, I have not mentioned. Taking all those things, with our high-priced land, we ought to be able to make a good rate of interest.

Now as to the cattle proposition, it would be owing whether I was going to run a big business or whether I was just going to farm on a small scale as to whether I handled any stock cattle and fat cattle. If I had a small farm I would get a dairy cow; if I had a large farm I would have beef cattle and would aim to handle my calves in January and February. Permit me to say I would prepare my corn fodder in the fall and hay and such stuff as I wanted for roughness, and I would carry them through on corn fodder and some corn. Then when spring comes and the grass gets up I would turn them out and carry them until the next fall along just before cold weather sets in. If the price of cattle was high and corn was high I most assuredly would let the other fellow feed them, but if the stock cattle was cheap and corn was cheap I would feed them a little through the winter, and as it came near spring time I would increase the feed and feed them until the month of June, I believe, not later than July. I would aim to get my stock as good as possible so when they grew age of the right character she cannot only be maintained but will gain up and fattened out they would be the regular beef type; have a straight top and under line, be broad, thick and heavy. This would be my idea, I am simply giving you my experience along this line as best I can.

Address by O. P. Hedge, before Mahaska County Farmers' Institute.

I have lived in the city most of my life, but I find life on the farm the most pleasant. I expect to remain there and what I say to-day will be positively my own experience. I have been on the farm handling hogs and cattle. It is not necessary for me to say to you that in starting a herd of hogs that we must have the very best stock, that we must not be satisfied without the best, and my experience has been that the earlier you have your pigs the better, and that they should be cared for in a simple business-like way as you would take care of any stock until they are large enough to follow their mother, and my experience has been that blue grass pasture is about as good a thing as I ever had hogs run on. While I am well aware clover is a good pasture for hogs, but it is not always convenient for us to have that. I find I can have a blue grass pasture easier and handy to the house. Some of us find we cannot always have clover as we would like to have it. Now these hogs as they run on the farm can be fed corn with grass; not to any great amount until the new corn comes in and as it has been said feed the new corn as soon as possible, and give them all that they can eat conveniently and take care of them in the right way, and by the first of December or the middle or first of the year they are large enough, and to my mind then it is the time to sell your hogs. I am satisfied it does not pay ordinarily unless you are well fixed, and the average farmer here to-day is not well fixed to keep hogs through the winter and make it successful. It is not often you can keep hogs that will gain as rapidly through the winter as in the fall, and as soon as you can get rid of a hog at $2.25 or $2.50 I believe it the best policy to sell the hog early and get him off your hands. And besides the corn field must always determine the size of your hog lot and the number of your hogs. I do not think it is profitable to buy corn and raise hogs. If you can raise your hogs and raise your corn you have a good profit but I don't believe it pays generally to buy hogs and buy corn and feed them. If you have a good corn crop you can buy hogs without any trouble and feed your corn to your hogs, but I have always made it a rule not to raise more hogs than I had corn to feed. I have always liked to handle cattle. I have never thought I was a success by any means handling hogs; I have always liked to handle cattle. I want to tell you there is nothing that will grow a calf like its mother's milk. You will have men tell you you cannot afford to let a calf suck its mother. I don't understand it that way. My experience has been two calves with one cow is the best result I ever had. If a man comes to your place and tells you he has a separator that will raise calves as well as the mother I would not buy it. If it did it would not be a good separator and you cannot raise them as good as you did the other way. I raise my calves, nearly all of them as I tell you, two calves on a cow. Once in a while we have a calf fed by hand and that calf shows the difference. Since I have been on the farm I never have fed but one of three year old cattle. I bought a car load of three year old cattle and fed them out. This last year I began in August feeding my cattle, and I fed them on barley, and I found they did as well as on corn. I fed them barley until the corn was large enough to feed, and I fed them on corn until December. I have done that two or three times, and I am not yet satisfied with that. I have now seventeen calves from last year, about half of them are heifers, and I expect to feed them out by next June. I believe the best time to market a steer is when it is eighteen months old; I believe we will get more for the money we put in them than at any other age. With the proper care and handling through the winter, and shelter, a calf will weigh 750 or 800 pounds, and you can have good ones if you have the right kind of stock. As far as keeping dairy cattle on the farm, I am satisfied it is a good thing. I am satisfied the man who has a small farm is wise in keeping good dairy cattle.

Address by W. L. HAYES, before Mahaska County Farmers' Institute.

I will say I have been a citizen of Mahaska county for forty-seven years. I have fed cattle in Mahaska county for twenty-eight years as feeders, and hogs for thirty-two years. Now, what do we keep a hog on our farm for? To decorate our farms? No. We keep them on our farms for the dollar that is in them. If we cannot get a dollar out of them we had better be without them, for they are subject to diseases—hog cholera and the hog measles and lung fever. I have lost several thousand dollars through these diseases. Chloral epsom is the best cure for these diseases I have struck anywhere.

The first gentleman on the floor I disagree with on one point: about the labor he puts into hogs, the expense he goes to for building. It is all right to have good shelter for hogs, but it looks like putting two dollar's worth of labor into one dollar's worth of profit for your hogs. I used to raise my hogs and feed out, and of late years I buy, buy them up in the spring, turn them on clover pasture and let them run through the summer up until harvest time, turn them in on an oat field or rye field, turn them from a rye field into the corn field, ten, fifteen or twenty acres at a time. I have hogged down corn that would make eighty-five bushels to the acre, and they ate that corn; drove them out of the corn field, loaded them on the cars and shipped to Chicago. So I do not do much labor to get them to market.

Three years ago, I believe, last spring, I paid $675.85 for 140 head of hogs. I turned those hogs on the grass, I run them on the grass through the summer and then on the rye and through the corn. I shipped those hogs in the fall to Chicago, sold them on the marget for $7.15. I realized $2,440 for the two car-loads of hogs, and had 135 hogs left. You men can figure whether there was a profit in that bunch of hogs or not.

There is lots of difference in the way cattle are handled, but what we want the steer for is the money, the dollar there is in it. If we cannot make a dollar we don't need him on our farm. Years ago I used to buy my calves and raise them; I would have ten or twenty cows with from two to three calves to the cow. I quit that and went to buying my feed and feeding them. I feed in the winter, summer and spring, but winter feeding, I claim, costs too much. Why? Because we farmers have not got the city heat; it costs too much to keep the animal heat in the steer; it is too expensive. Still, I have a very nice place to feed; my cattle can go in on the floor and eat their feed in the dry. I have a large fountain fed by a spring with cement tank, and they can come up and drink any time. They say if you water your stock at three o'clock in the afternoon once a day is enough. If a man's stock can drink whenever they want it, that is the way it should be. I have seen my cattle go to the drinking place by sun-up in the morning; you will see a few steers straggling down for water; they want a drink; they will not drink too much at a time. But you let them go, and water them at three o'clock, and if they don't drink till then they will drink too much, and they overgorge, and it is a great detriment to your cattle.

I tried to buy a man's steers in my neighborhood. I offered him three cents a pound for his cattle. He said, if you can make money out of these cattle, I can. That was in the fall of the year; his cattle were full of sap; they were heavy. The gentleman fed those cattle until the next spring, and I have his word for it; I asked him what was the gain on his steers, and he said thirty-five pounds to the head. Is that handling stock and making money out of it? That man ought to sell his farm and quit business. Now, there are lots of cattle fed that way. I feed through the winter, and my average runs different, different years; some winters are harder than others; it runs forty,fifty, sixty, and even seventy pounds to the head of gain. I have fed in the spring time on grass, and get as high as seventy-five and 100 pounds gain on the grass, that is, with grass, ground corn and cob and oats mixed. I have fed snapped corn, but I think the best way to feed corn is to soak it, yet I never was especially satisfied that way; it is too much labor to grind the corn; there is no profit left for me; too much labor to grind the corn. It will pay you to grind corn for your cattle if you have no hogs, but if you have hogs plenty, it don't pay any man to grind corn for his cattle. The best gain I ever got on cattle was on grass, rock salt and water. I bought one bunch of cattle the 15th of May, and they averaged 900 pounds; I paid three dollars a hundred for those cattle; I sold them on the 15th day of September, weighed them up, and they averaged 1,300 pounds. There was 400 pounds gain in four months to a day. Now, that was on grass, no corn. They had not had a bite of corn. There was some profit in handling cattle. One great fault with we farmers is, there is a little too much hog about us. We overdo our pastures; we pasture our pastures till there is nothing on them. Blue grass is the best grass that grows out of the earth for cattle; that has been my experience, at least, provided you have the grass; but we ought to have forty, or eighty, or 100 acres of grass that lays all summer with nothing on that grass the summer through, and then turn in the late fall, and in the winter and in the spring when the new grass comes up through this heavy grass, your stock will thrive, and you will not have to wait until the middle of the summer before your stock begins to gain.

About this labor we all put in our hogs, I don't believe in that way. What we want to do is to accumulate the most dollars and cents out of stock for putting so much in. If it costs us ten dollars to raise a hog and we only get eight or nine dollars out of the hog, there is no profit left to pay our taxes. Land is too high, we have got to farm it different from what we used to do. Our land is so much higher. I am no dairyman, and yet I think the dairy is all right in its place, but that is for a younger man than me. I used to follow it, but I am getting too old for that; I leave that for these young fellows, these young men around here with fuzz on their upper lip, who are looking for a wife. Now, the men who go out here and marry some of these girls who have been raised right, you furnish them six cows and three dozen chickens, and they will make money for any of you. If you furnish them with twelve cows and six dozen chickens, you can buy 160 acres of land and those girls will pay for it.

Address by J. B. Bolton, before Mahaska County Farmers' Institute.

If I feed at all I want a good dry place and feed snapped corn. Why? Never feed them in May or June when they eat grass. If you feed them straight corn they don't ruminate that corn and your corn goes through the animal. If you feed them snapped corn they will ruminate and digest that corn as nature provided. I know two men who shipped two car loads of cattle this year. One corn fed and the other grass fed. The grass fed cattle brought the most money in Chicago. They were the fattest in a sense because they were a little heavier cattle. These cattle were both bunches bought and raised in this county. I have had the same experience. I bought 154 cattle one summer and another bunch and did not feed them any corn at all, and the only money I made I made on the grass fed cattle, the ones I did not feed any corn. You get the price too high. Then again, you buy a steer and he has eaten up your pasture, you more than $7.50 a hundred. If he made you a hundred he has not made you any money, he has got too much corn; your land is too high and you have got to utilize what you have got and you want to utilize your grain if you make a dollar. I would do as Mr. Roe did, but I would feed them a little corn through the winter and I would not give them a bite of corn in May and June. Feed them enough to be good and strong. There is no money made in feeding cattle with high priced corn. Hog is king. But you cannot keep a farm with one kind of stock. The hog's trouble is disease, if you can get away from the disease hog is king. Now you take that steer that is fed a little corn during the winter, take twenty and feed them as even as you can, put ten on blue grass pasture without any corn at all, put the other ten on blue grass pasture and feed them all the corn you want and there will be but little difference in the weight of those steers, if any, on the first day of July. I put on more pounds on my cattle than I did with corn. In relation to hogs I have nothing to say. I insist on plenty of water, plenty of good grass and then what else have you done? Instead of removing anything from your soil you have it better than when you commenced.

One more thing, we have a law in our statute books that requires the board of supervisors and auditor to make a statement of your bonded indebtedness. I don't know how much your bonded indebtedness is, I have no idea. I know what the floating debt is. It is a good big one and we ought to know something about this. One other thing, look out about centralization of farm lands. Keep your boys at home on the farm.

HOW CAN SHEEP BE MANAGED FOR THE BEST RESULTS?

M. Downey, before Mahaska County Farmers' Institute.

In regard to shearing in the spring. This depends largely on the condition of the wool market. If the sheep are extra fat and you have a good price, it generally pays to shear.

As regards handling sheep for best results, I am not able to advise you old sheep men, since I have had only a few years' experience in handling sheep myself; therefore what I have to say on this subject will be with a view of aiding a beginner in the sheep industry.

The question with many farmers who would like to start a flock of sheep is, whether it would be profitable to pay present high prices for breeding ewes. I believe that it will.

According to government statistics, sheep in the United States have decreased from 64,000,000 in 1893 to 46,000,000 in 1904. Most foreign countries also report a decrease in numbers, while the consumption of both wool and mutton has increased. At the rate they are being consumed it will be several years before sufficient numbers can be raised to overstock our markets and reduce prices to an unprofitable basis.

For profit I would prefer a medium wool mutton breed; but successful sheep husbandry depends in a good measure upon selecting a breed suited to the local facilities of the man, the farm and the market. I believe, all things considered, the April lamb is the most profitable, as at this time of the year a greater per cent. can be saved than earlier. Grass is beginning to grow, and while the grass is not usually sufficient at this time to sustain the ewe, within its self will be a great help in starting the lamb to grow rapidly. The lambs should be kept growing, as the best wool and the best mutton are obtained from sheep that have been kept growing all their lives. Where it is possible to do so, change your sheep on different pastures frequently, as this in one of the best remedies as well as a preventative of parasites or stomach worms, the greatest hindrance to successful sheep raising in Iowa I have found that clover with a small quantity of rape seed sowed in small grain in the spring makes an excellent fall pasture. Rape sowed in the corn at last plowing also makes a good late fall pasture and if the corn is not down makes a good place to turn the lambs at weaning time. Another important matter which is often neglected is the dipping of sheep. Dipping prevents ticks, scab and other skin diseases. This usually should be done after shearing. Be careful to select some good standard dip as there are spurious dips on the market and where used the results have been disappointing.

Each fall the old and unprofitable ewes should be culled out and the choice ewe lambs should be selected to keep up or increase the flock. The cull ewes and remainder of the lambs, if they are a mutton breed, can be fed for winter or spring market. A word to the new beginner at feeding may not be amiss. Commence feeding grain sparingly and gradually increase, but at no time feed more than they will clean up in a reasonable time.

Give them all the roughness they will eat. Clover hay and corn fodder is the best we raise here. Don't feed much timothy hay, my experience is that good oat straw is better. Give them access to salt and pure, clean water. This is important. Sheep will not drink out of a filthy tank or trough. Provide a shelter of some kind; a shed open to the south is sufficient. When your sheep are ready for the market it is usually best to sell them; as it seldom pays to hold fat sheep long for an advance in price.

HOW CAN SHEEP BE MANAGED FOR THE BEST RESULTS?

WILLIS PETTIT, before Mahaska County Farmers' Institute.

This is a very big subject for me to undertake to tell this audience how to manage.

I handle sheep in a small way and am only reasonably successful.

Keeping from seventy-five to one hundred as a breeding flock,I mate them so as to have the lambs commence coming the last days of March. I think it better to have them come rather early so they will be large and strong before the hot weather comes on; as that is when the stomach worm gets in its work. The bigger and stronger the lamb is, the better it can resist the ravages of the worms, as they, with the dog and tariff reform, are the greatest drawbacks the sheep man has to contend with.

I keep the Shropshire breed, as I think in small flocks they are the most profitable. Wool and mutton combined I get from 8 lbs. to 9 lbs.

per fleece and sell the lambs, mostly in October. After reserving the best ewe lambs, get an average of from 70 to 80 pounds without any grain.

I generally average from 100 to 125 per cent of an increase in the flock of breeding sheep. I never intend to let the ewe lambs mate the first year, as I think it has a tendency to stunt them and they seldom produce as good a lamb as an older sheep. I do not shear my flock as early as a great many do for I don't believe it is right to take their coat off when I want my overcoat on and the wool will weigh better and shear easier to let the oil rise before shearing.

Grass is my principal feed; I never feed the old sheep when the grass is good. My general winter feed is shock corn and fodder. Toward spring I like to give some hay, and prefer clover if I have it. I think our agricultural papers make more fuss about giving our sheep corn than there is any use in. I usually give about one ear per head a day to the old sheep and a little more to the lambs. I believe it would be profitable to give the lambs some grain while with their mothers, but have never practiced it.

Address by J. F. H. TAYLOR, before Mahaska County Farmers' Institute.

This subject is interesting to me, and the two gentlemen who just preceded me have certainly given you good ideas on handling sheep in a small way. My business is more buying and selling than producing—buying and shipping. I was just thinking, while our brothers were talking about the hog and the steer, I was just thinking that our sheep would remove the mortgage from the farm a great deal quicker than both of them combined. I have been accustomed to have the care of a small flock of sheep since I was a small boy; ever since I was able to carry an empty basket I have had the care of sheep, and as a matter of course, in doing the kind of work we do, we form a habit of liking, or should like it, and we should like that in which there is the most dollars and cents to be derived from.

I will give a few illustrations of what I know to be facts, and a little idea of what the sheep are making at the present time. I will begin back eight or ten years ago when wool was worth from ten to fifteen cents a pound, and sheep were selling at two cents and two and one-half cents a pound, and lambs were selling at three or four cents a pound. Men who owned sheep at that time were satisfied at the profit they were getting out of it, while at the present time lambs at home are worth five and a half to six cents, and yearlings are worth from $4.75 to $5.75 at home, and the old ones, as you are aware, are classed differently on the market, and the older type are running from four or five cents per pound, which you will see readily is double, or about double the price we used to get. While we were getting at that time for wool from ten to fifteen cents per pound, at the present time our wool is worth on the home market from twenty-five to twenty-seven cents per pound, and in my opinion sheep on the farm is the most profitable animal we can keep, But this will depend, however, to some extent upon the location of the farm. Our low bottom lands are not well adapted to sheep industry.

While, however, I might say to those who might wish to embark in the sheep industry, your sucess on the low lands will depend to some extent upon the breed of sheep you handle. If you have a bottom farm and wish to start in this business I would advise you to select for your flock some of the finer wool breed. The Rambouillet or Delaine would be the best, and you could handle more of them in a flock than you can of the longer wool, or mutton breed, and at the same time the wool will sell on the market. A few years ago there was a little difference made, but now they sell almost identically alike.

In my opinion a man on a small farm, from 80 to 160 acres, can not afford to do without a small flock of sheep, for several reasons. The sheep, as you are aware, is a browser, and the sheep will utilize a great deal of roughness on the farm that would otherwise be lost, after your horses and cattle have eaten the hay, and wasted considerable of it. Speaking of clover hay, as Mr. Downey said, timothy hay is almost worthless. I would say that a flock of fifty ewes kept on a 160-acre farm, where the fences are all tight, could be transferred from one field to another and used as a scavanger, if you may so call it, and will pick up the waste food, or what might be left at the harvest time. They will clean your oat field, your hay field, and after your corn is gathered your sheep will still thrive if the snow is not on after you think you have gathered it.

We will take for illustration a flock of fifty sheep. Now, supposing you are on rolling land; I would prefer a small flock if I had the long wool breed. My choice is the long wool breed. But in my opinion the most profitable breed than can be kept on our farms in a small way is the Shropshire. The Shropshire has the fine form and medium length wool, and the lamb will fatten at any age. We will take a flock of fifty ewes on the small farm. I am speaking of what I would do if I was on a farm big enough to handle them. I would mate these ewes so the lambs would begin coming, I would say, the last of February or the first of March; the lambs should all be good-sized before shearing time, and while I am not fixed to keep sheep at home, I have a lot out on another man's land, and these flocks I own are making an increase of about ninety per cent each year. Now, the best illustration, and to take the shortest time, would be to tell you what they have done. I have in my mind at present a flock of sheep I put out on shares for one year. The best time to put them out is in the fall. I put forty head of Shropshire ewes and a male out on the last day of August. This man kept them one year, and by the way, I put them out for one-half of the wool and half the increase. I took my part of the increase at the close of the year. I take my part of the profits of the wool whenever it is easily sold. This flock of forty ewes produced fifty lambs. I am just telling you, to give you an idea whether it is profitable. At that time I was paying four cents a pound for the lambs to ship, as we usually figure on a cent to ship them. The wool from this flock was at that time eighteen cents. I believe we only got about $55.00 for the wool, but if you will figure it up you will see there was quite a profit right there.

Now, if I were handling sheep on a large farm, as Mr. Downey and some of the more favored brothers, I would say that they could be handled with greater success on a large farm, provided you have your farm divided off in fields and change them from one field to another. Now, at the present time these sheep were making on an average of about ninety per cent. to the flock, where they were well kept. I could cite you to flocks that are making an average of about ninety per cent, increase, and I know what these men are getting for their lambs and wool, for I have followed that for a number of years. The last two years I have been buying wool. These lambs, as I have said, come the latter part of March until the middle of April, or before shearing, which depends on the spring. These lambs I have been handling mostly I buy and ship right off the grass. This fall I think I bought about 1,400 head of lambs and they gave me on an average about five and a quarter. The average weight of these lambs is about seventy-five pounds. Well, we will say they cost about $4.00 a head. The wool off of these ewes paid twenty-five cents a pound; the average weight of the average shipment of fleece is eight pounds; that is $4.00 for the fleece and $4.00 for the lamb; this will give you ninety per cent. Take ninety per cent. of that and you have about $4.40 per head on the original flock, providing you sell your wool and sell your lamb. However, I will say that I believe I would be sufficiently correct to say that the Shropshire ewes in this and adjoining counties at the present time are making $5.50 per head for the money invested. The next thing would be to the beginner-in-chief, as I have said what breed you take would depend upon the location of your farm. If you are thinking of embarking in the sheep business in a small way, I would say that in small flocks the Shropshire sheep, in my opinion, is the best. I would be willing to start in a small way. A great many will say, if a little is good, more is better. But it will not do in the sheep business. While you may start with fifty ewes and make 90 to 100 per cent. each year, you cannot do that with 100 ewes and keep them all in one flock. The larger your flock the smaller will be your per cent. of profit. If they are kept the same, the small flocks will produce a larger profit. They will save a greater per cent. of their lambs and the lambs will be marketable at an earlier age. I would say a few words to the young man who is thinking—as I have been asked the question a number of times in the last six months, as a great many are just beginning to find out the sheep are paying.

I have been asked the question: will it pay to go into the sheep business at the present time? I would say I certainly think it will, even at the high prices; I would say begin in a small way, with a small flock of twenty-five or more. But if you have never handled sheep, don't buy over fifty to commence with. Be willing to start in a small way, and as your knowledge increases your flock will increase, and in this way you will make the most profitable profit that can be made. I would say this in answer to the question I have been asked, will it pay to buy sheep at the present time, considering the high prices? There is nothing in sight that has a tendency to lower the price of either wool or mutton. Eleven years ago last August I believe I made my first shipment to the Chicago market, and to illustrate this I will just give you a few facts. At that time I paid two cents a car-load on sheep and lambs, near Barnes City. Three cents a pound was an outside price to pay, and I think the lambs cost me $.75 and I got $4.20 for them. Now, those times are past. At that time four cents was the top price for lambs, while today eight cents is our top. At that time ten and twelve was the top for wool, now twnety-seven to thirty cents is the top and as Mr. Downey says, foreign countries are all short on sheep. Lots of people will ask, why is it sheep are worth more today than they used to be? Why is it it takes more to feed the people, there are more people and more to feed and more to clothe? There is another reason. While there was one person who would eat mutton, I will say , ten years ago, there are nearly three eating mutton today. There are different conditions that give us reason for the advance, and for that reason this advance will be held. There is nothing in sight to lower the price of mutton or wool. Nothing in an over-production which can come, in my opinion, under five or six years.

I would say, gentlemen, I have had the care of cattle and hogs and horses until I was twenty-three years old on my father's farm, and we always kept a little bunch of sheep, and since I have been doing for myself I have handled this stock more or less until within the last twelve years, and I know what these men are making. I will say that the sheep, when it comes to dollars and cents, net a profit for the amount of money invested, and the amount of labor used, and the amount of feed consumed. Sheep is king over all other domestic animals for price at the present time.

Address by G. W. France, before Mahaska County Farmers' Institute.

I will give you my reasons why so many fall down in the sheep business. It seems to be a common opinion that sheep will live on nothing. We know we have got to feed our hogs if we get anything out of them. We know we have got to feed our cattle; but we neglect our sheep, thinking they can live on anything that is left for them, and that is one reason we fail so often with sheep. It has been suggested here, and I approve of it, that every farmer can raise a few sheep. You cannot afford to get along without them. That is all right. I don't know how you can afford to get along without sheep, but nine out of ten will make a failure to go into the sheep business with that understanding—that they will take care of themselves. And then you are not fixed for them, as a general thing. You have got to have tight fences, and control those sheep, or the first thing they are getting through on your neighbor's lot, and they are getting into your own crops, with poor fences, and you neglect them, and you soon get rid of them. And the greatest known detriment I have found to the sheep is the dog. You cannot raise sheep in the same neighborhood successfully, unless you prepare to protect your sheep, where there are a lot of dogs. Some people would be very much offended for you to kill a dog. You cannot get into a racket any quicker than to kill a neighbor's dog. That is one of our graetest drawbacks. I never could see the benefit of a dog. I know two men, one of whom has retired. He commenced a poor boy, and one time I asked him why he didn't have a dog. He said: I cannot afford to keep a dog; I can't afford to run the risk that dog might be to my neighbor; it might go out and scare a neighbor's team and maybe cripple some one. Now, the dogs are worth nothing. The New York State Supreme Court decided that they were game; you can shoot them down any place; there is no value to them. The next is the poor fences. I kept 600 to 800 sheep. When I sold them it was all clear money. I have made money out of sheep, but the worms got in among my sheep, and I must admit I was careless about it. If I had given those sheep salt and turpentine I don't believe I would have made the failure I did. I kept sheep thirty years before I made that failure. I failed, and I had to sell off my sheep, and since then I have been buying sheep. Now, as we have heard, ten sheep will make you $50.00—they will clear $50.00. You keep a cow a year that will eat as much as those sheep and she will make you $50.00. You can make more out of a cow by dairying than any other way. You can make more out of butter and cheese, and the milk is always worth more than it is to raise the calf on. Now then, that cow; you can give her all the chance, and will she make $50.00? You take that cow and you have to work seven days in the week. How much time have you got to put in on the sheep? I should have taken 100 sheep and ten cows; you would have seen it plainer. Now, which has made you the most money for your trouble? His statement is correct. I know he is right about it. Which is the easiest, which has left your farm in the best condition, the sheep or the cow? I know there is no live stock that can increase or decrease as quickly as sheep, but you want to go on with them and you will come out ahead. I have kept sheep and cattle, and my sheep will make double the money cattle will make.

Address by Mr. Arnold, before the Mahaska County Farmers' Institute.

I will tell you why I keep sheep. Not for the money. When I quit keeping sheep I quit farming. I would not farm without sheep. I am a strictly hog and cattle man. I find my pasture grows up in the weeds if I don't keep sheep. I find my stubble grows up, and I turned my sheep on the stubble, and they cleared it up without any expense, and I find that it is clear profit. It don't pay me to raise cockle-burs, but I cannot farm successfully without sheep. My pasture grows up and it looks bad; the farm looks bad without sheep. I am not able to kill all these weeds, but the sheep will do it cheaper than I can hire it. I believe in keeping all kinds of stock on the farm. You cannot make a success without keeping all kinds of stock; too much stock of any kind don't do well. Divide the stock out amongst the sheep and cattle and hogs, and the farm will be a success where it would not be, not to keep all those kinds of stock. I know the sheep clean up the farm. I know there is a clean profit in a small bunch. I had a hundred sheep once, and I reduced it because I had bad luck.

FEEDING THE BREEDING HERD.

By H. R. SMITH, Professor of Animal Husbandry, University of Nebraske, Lincoln, at the Kansas Improved Stock Breeder's annual meeting, January 9-11, 1905.

As we read of the old types of cattle and contrast them with the new we are awed with the result of two centuries of animal breeding, and bow in homage to such men as Bakewell, Robert and Charles Colling, Booth, Bates, Cruickshank, Tompkins, Price, Watson, and others who were pioneers in the work. And in paying our respects to the sons of Britain we must not forget our own countrymen and what they have done in the continuation of this great enterprise. To whom does the world owe a greater debt of gratitude than to these men who devoted their energies to the creation of a better article of food for humanity and a better source of revenue for the great mass of producers? Surely such men are public benefactors.

The fruits of the labor of our predecessors are given over to our charge. If further improvement in our herds is no longer possible we should at least prevent retrogression. But further improvement is possible, and it must come as our system of farming becomes more and more intensive to meet the exigencies of an increasing population. The breeder of pure-bred stock of today occupies a most responsible position. He has at least to maintain present standards in his own herd, and he must furnish the seed for the improvement of the common stock of the country. It is a position fraught with danger because of the temptation to sell that which will bring the most money, keeping in the herd the less salable. But it is not the province of this paper to give caution or make suggestions concerning the selection and marketing of pure-bred cattle. It is to be confined to the feeding of the breeding herd.

The long, lank, late-maturing Texas steer is a thing of the past. In its stead we have today in considerable numbers the broad, smooth, early maturing Short-horn, Hereford, Angus, Galloway. What has wrought this great change in animal type? Chief over all has been a judicious system of feeding. Environment causes variation, and good feeding induces a change for the better, making possible improvement by selection.

Since judicious feeding is largely responsible for improvement in the past, it is reasonable to suppose that it will be just as potent a factor in the future. If you will examine the qualifications of our most successful breeders of to-day, men who are producing the best types of cattle, you will find them good judges and good feeders.

Feeding the pure-bred herd resolves itself into two questions, viz., How much, and what, should be fed?

As to the amount, we are limited on the one hand by the actual physiological requirements of the animal for best development, and, on the other, by the expense of a liberal system of grain feeding and a possible danger of impaired breeding power incurred by excessive fatness.

If the herd of cows is considerable in number, a ration made up largely of grain would necessitate the expenditure of an amount which would cut deeply into the revenue from sales. A mature cow in calf but not giving milk does not require heavy grain feeding. If given roughage of the right character she connot only be maintained but will gain in flesh. During the recent years, when grain has been high in price, the importance of having good roughage is more and more apparent.

In the West we are favored by having alfalfa, a most valuable forage crop for cows. It can be made the entire ration for a dry cow, but more economy is practiced if our cheap corn-stalks are fed with it. Stalks, cut just as soon as the corn is ripe and then properly cured in the shock, are relished by cows and should be fed, not only because the stalk is a product which might easily be wasted, but because it makes alfalfa a more nearly balanced ration for cows, lessens the tendency to scour, and furnishes variety. The quantity of alfalfa fed should be double that of corn-stalks. Without corn-stalks, prairie hay, sorghum, Kafir-corn or oat straw could be used in the same way; without alfalfa, clover or cow-peas could be substituted. Whereas the cow before calving needs but little or no grain with rough feed of the right kind, the suckling cow needs a ration of great efficiency which means one made up of a liberal allowance of grain. The tax on such a cow is so great and the full nourishment of the growing calf is so important, it is poor economy to practice anything but a liberal system of grain feeding.

The feed for the young mother should not only be liberal, but it should be of a character that will stimulate a good flow of milk. For developing a young calf nothing seems so good as fresh whole milk. Our well-bred beef cows are not especially noted for milk records, and anything which can be done to make them yield their maximum will be duly appreciated by the calf. Here again we find it advantageous to make liberal use of alfalfa for the roughage part of the ration. Alfalfa is especially suited for milk-production because of its high protein content and its richness in mineral constituents. In both it compensates corn perfectly, gives us a balance of nutrients which meets physiological requirements. What is still more noteworthy is, that the best balance of nutrients is obtained when just enough alfalfa is fed with corn to give the correct proportion of grain to roughage.

While I do not think that with us the time has come when the making of ensilage will be found the most profitable way of handling the corn crop for fattening stock, I do think a silo should be found on every farm devoted to the breeding of pure-bred cattle. We all know that there is nothing like good blue-grass to make a milch cow do her best. For winter feeding, the nearest approach to blue-grass is roots or ensilage. Both are extremely succulent, which quality is certainly desirable for milk-production. Here in the West we can put up ensilage at a cost per ton not to exceed half of that for mangel-wurzels of other roots when the latter are sliced ready for feeding. One could hardly conceive of a ration more suitable for a cow nursing a calf than alfalfa, corn ensilage, and a little dry grain, consisting of corn and bran with perhaps a few oats.

Now, suppose that under the most favorable conditions so far as feeding is concerned the cow still fails to give the calf all the nourishment it needs. This brings up the question as to the use of the nurse-cow for rearing pure bred calves. We find stockmen who favor the nurse-cow, and we find others who oppose her use on general principles. Some men argue that if a cow does not give enough milk to raise her own calf she should not be found in the breeding herd.

In breeding pure-bred cattle, the aim of the breeder is to produce thick-fleshed, easy-keeping sires, to distribute over the country for use upon the grade cows. As the country develops the dairy cow gradually comes into more prominence. This will continue so long as the population increases and there is need of more food to supply the people. It is a fact that much more humus can be supplied from an acre of ground when the crop is converted into milk than when it is converted into beef; and as the country increases in population, making labor more plentiful, the dairy industry will grow.

In keeping cows upon the average farm, it does not pay to keep anything but first-class milkers. From the strictly special purpose of dairy cows, we cannot expect a good quality of feeding-steers unless we use the very best types of beef sires, to counteract the dairy tendency in the dam. In producing the low-down, thick-fleshed, easy-keeping sire, to cross upon the dairy stock of the country, we must confine our energies to the production of beef qualities, rather than try to produce dual-purpose sires. In the management of the breeding herd of beef cattle, we therefore must waive milking qualities to a certain extent, since beef and milk cannot be developed to a high degree in any one individual.

If, in the production of young bulls for distribution among the farmers, we fail to give them, at the start, a liberal supply of food, we cannot expect to breed into them that tendency to transmit easy-keeping and quick-fattening qualities to their offspring. And if the dam does not supply sufficient milk to provide the best development for the calf, certainly a nurse-cow should be provided. In this connection, I am of the opinion that the nurse-cow is even more important for raising young bulls than heifer calves.

In the care of the herd bull the same principle holds true. In discussing the management of the cows, it was suggested that because of the expense in furnishing feed it is not always practicable to keep the cows in high condition. Since the herd bull exerts as great influence upon the character of the offspring as is exerted by the forty or fifty cows in the herd, it is very much more economical to feed the one sire than the forty or fifty cows. The herd bull cannot be too well cared for. He should be kept in as high condition as possible, so long as it does not interfere with his usefulness as a breeder. More injury is done by the character of the feed than by heavy feeding. Fattening herd bulls by a liberal use of corn is often injurious in its effects. This is because corn is excessively starchy and induces a deposition of fat about the internal organs In feeding the herd bull, it is very necessary to supply those foods which will develop lean as well as fat, and those foods which will give vigor to the animal. Such a ration should be made up largely of foods rich in protein, like alfalfa, clover, bran, oil-meal etc. If the roughage supplied the herd bull consists of alfalfa it would be entirely safe to make the grain ration half corn, the remainder consisting of oats, bran and oil meal. if the roughage consists of timothy or native prairie hay, it would be better not to feed the herd bull more than fifty-two per cent. of corn. Roots or ensilage are excellent to prevent injury by over-feeding.

The character of the feed, important as it is, is not the only thing which needs attention in the care of the herd bull. He should have a great deal of exercise, and if he does not take sufficient exercise himself, it is sometimes advisable to lead him about a little each day. Ordinarily, however, if he is given a small pasture field in summer, he will take sufficient exercise.

In closing. I wish to say that I believe the pure-bred cattle business will continue to be profitable if properly conducted. We have here in the West a most excellent country for cattle. Our farmers are certain to need more than they have had in the past, if they are to maintain the fertility of their land. No one will dispute this fact, that a well-organized farm needs cattle. Neither will any one oppose the statement, that if cattle are desirable to have on our farms, good cattle are still better. The farmers of the country look to the breeders for furnishing the seed which will improve their stock, and every breeder of pure-bred cattle should make a thorough study of the business. not only to supply the farmers' needs, but also to make his work yield the revenue it should.

PREPARING BEEF CATTLE FOR MARKET.

W. J. MILLER, METZ, IA., before Jasper County Farmers' Institute.

From a business standpoint this is a subject of great importance to the producer, as well as to the consumer, since the markets of the world are demanding different types, or grades, of beef cattle. The successful feeder must be acquainted with the given demands of the trade. He must study the best methods by which this demand can be supplied.

The feeder must first secure the right types of cattle to feed. They must be well bred, of uniform type, low-down, blocky, thick-fleshed cattle to command the highest market price.

In selling the beef cattle the first important feature is the finished condition of the animal. The carcass that will dress the highest per cent of high-priced beef per hundred, sells for the highest price in the open market . Our markets are now demanding handy weight cattle of 1100 to 1400 pounds. What we want then is to get our cattle to that weight in the shortest time possible. Get them to the market before they pass the age of two years. We cannot afford to keep cattle on our eighty, to one hundred dollar land, for more time than twenty-four to twenty-six months. We find but very few three and four year old cattle on our markets to-day and they are fed at a loss as the buyer discriminates against large, coarse cattle.

In the individual classes, in the show-ring the judges will scarcely look at them as they are too large and coarse, and have too much waste, or low priced meat per hundred. If we expect our bank-book to have black figures on the right-hand side of the ledger, we must feed and breed the kind of cattle the public demands, the low-down, thick-fleshed, blocky type.

My experience in feeding cattle has been somewhat limited. I generally let the calves run with the cows until they are from six to eight months old, when they are placed in the feed-lot and fed a grain ration of two-thirds corn and one-third oats, with corn-fodder, straw and clover hay for roughage, during the winter months; in the spring time they run on a blue-grass and clover pasture, with a grain ration, but are not put on full feed until about September 1st, when they are fed all the grain they will eat with one pound of oil-meal per head each day until marketed. I prefer yearlings to two-year-olds, as they will gain as much per head and you have not so much invested in each animal. My experience is that yearlings will gain seventy to one hundred twenty pounds per month, or an average of eighty-five pounds. These are gains on the cattle fed in the open feed-lot. Show cattle that are fed continuously on full grain ration will not make the gain for as long a period that feed-lot cattle will. I am a strong advocate of finishing cattle before placing them on the market, as a finished animal brings from one to two dollars more per hundred than the "warmed-up" cattle do, and that is where the profit is in feeding, if there be a profit.

At the late International fat stock show, the grand champion steer, Black Rock, weighed 1,650 lbs. and sold for $25.00 per cwt. or 25c per lb. The grand champion car load averaged 1,524 lbs. and sold for $8.65 per cwt.

18 car loads of Angus averaged	$6.82
21 car loads of Herefords averaged	$6.69
9 car loads of Short Horns averaged	$6.65
1st prize heifers car load averaged 1039	$6.80

2nd prize 1 year old heifers averaged 990 sold for 6 cents.

So it appears that the handy weight, well-finished cattle are the ones at the top of the market and secure the ribbons in the show-ring. Iowa won the Grand Champion on two-year-old steer; also the Grand Champion car load lot and won more prizes than any other state in the union and Jasper County had the largest exhibit of any county in the State and secured more premiums than any other county in the State.

If we expect to maintain our reputation we must continue to improve our farm products as well as the live stock. There has been but very little money in feeding cattle for the past two or three years as the price of grain has been too high as compared with the price of beef. The feeder has been compelled at times to pay Chicago prices for his grain. The successful cattle feeder is a benefit to his community, as he furnishes a home market for the surplus grain; also a home market for all well-fed cattle.

In conclusion, I would say advisedly to you to encourage the man behind the steer as he is a public benefactor to your community.

EXPERIMENTS WITH HAND-FED CALVES.

Extracts from Kansas Experiment Station Bulletin.

With the advent of creameries, skimming stations, and hand separators, the question of seccessful and economical raising of calves on skim-milk is one of growing importance and vital concern to every creamery patron and private dairyman. As land increases in value, we can no longer afford to keep a cow the entire year for raising one calf to be used as a feeding steer.

For the last four years the Kansas Experiment Station has almost continuously been conducting experiments in rearing and feeding calves on skim-milk or substitutes for skim-milk. The material given in this bulletin is the result of our experience.

Care of Cow before Calving. Strong, thrifty calves can-not be expected from cows that have received poor feed and poor care previous to calving time. The cow must be supplied with wholesome and nutritious feed, containing the elements that are necessary to the proper development of bone and muscle in the fetus. It is better for the cow, and we believe better for her record in the production of milk and butter-fat, if she can go dry for six or eight weeks previous to calving. If it is impossible to dry her up without injuring the udder, continuous milking should be practiced.

Where the cow has access to good pasture with plenty of spring-water she needs little or no attention until two or three days before calving. If she has secluded, shady and otherwise comfortable quarters separate from the other cattle, and is carefully watched by an attendant she may need no other attention until after the calf is dropped. Sometimes luxuriant pastures will stimulate heavy milkers to produce too much milk prior to calving, in which case the supply of feed should be reduced, and in extreme cases the milk removed before calving.

When kept on dry feed care should be taken to provide plenty of succulence. Ensilage and roots serve an excellent purpose, the object being to keep the bowels loose. When alfalfa or clover hay is used for roughness very little grain is necessary. With less nitrogenous rough feeds, a grain mixture of two-thirds bran and one-third oil-meal is excellent. Soy beans may be used as a substitute for oil-meal.

Care of Cow and Calf at Calving. In cool or cold weather the cow should be placed in a box stall well lighted, with plenty of ventilation. When the calf is dropped it is well to blanket the cow until she regains her normal condition. In the absence of anything better, gunny-sacks sewed together will do very well. Light-loosening feeds, water from which the chill has been taken off, should be given. Cold water is liable to cause contraction of the womb and detention of the afterbirth. If the latter is not discharged in from twenty-four to forty-eight hours it should be removed. If the udder is heated and caked it is advisable to milk the cow frequently, though not quite dry, and the udder should be steamed by rubbing with a flannel cloth dipped in as hot water as the hand will bear, after which the udder should be rubbed dry, and treated with camphor, oilve oil, or camphorated vaseline. If there are any signs of constipation, it is well to administer from one and one-half to two pounds of Epsom salts dissolved in water. All these points will aid materially in keeping the cow in a good, healthy condition, and consequently give the calf a good, healthy start.

As soon as the calf is licked dry by its mother, it should have strength enough to rise and suck; if it has not, it should be assisted. The calf may be taken away from its mother after its first meal, or, if preferred, can be left with the cow until the milk is good. It is easier to teach the calf to drink if it is taken away early. Our experience is that if the calf is taken away at once, or when four or five days old it will make good gains the first week, but if left two or three weeks, the first seven days after weaning will be a losing period. If the cow's udder is caked it is desirable to leave the calf with her, as the rubbing of the calf tends to alleviate the inflammation.

FEEDING MILK AND SKIM-MILK.

Breaking the Calf to Drink. It is well to leave the calf by itself for at least twelve hours and, in case the calf has run with its mother for several days, possibly twenty-four hours. Attempts to feed the calf earlier than this usually do the calf no good and may injure the feeder's temper. If the calf's muzzle is held in the milk and its mouth pried open once, so that it tastes the milk, our experience tells us that the calf can be taught to drink without the feeder being obliged to place his hand in the milk and allow the calf to suck his finger—an uppleasant experience in winter weather.

This Station has had some experience with calf-feeders, which consist of a rubber nipple and tube, the latter fastened at a convenient height for the calf to reach, and the tube placed in the milk-pail. The manufacturers of these feeders claim that a calf can be taught to feed itself easier, and that it does not gulp its milk down as when drinking out of a pail. Our experience indicates that the first point is not well taken; that it is as easy, if not easier, to teach the calf to drink without the feeder. With the feeder the calf loses the nipple, and is unable to find it without assistance from the attendant. As to rapid drinking the statement is all too true—so much so that in cold weather the milk will become entirely too cold before the calf can consume it through the feeder. The feeder is difficult to keep clean, and a person will need a dozen in order to keep himself busy feeding calves. Four to five buckets will keep one man busy. We weighed our calves under experiment once every week, and found that there was no difference in gains between those which consumed their milk slowly through the calf-feeder and those which consumed it rapidly from the pail.

THE NECESSITY OF FEEDING SOME WHOLE MILK. The calf is unable to handle hay or grain until it is a week or ten days old. During this period it is not wise to try to feed skim-milk. At first the whole milk should be fed three times a day—four pounds in the morning, two pounds at noon, and four pounds at night, at blood temperature. In about a week or ten days the calf can be fed twice daily. During this time the allowance of whole milk can be gradually increased to about twelve pounds. The amount depends somewhat on the individuality of the calf and its ability to handle increased quantities.

CHANGING FROM WHOLE TO SKIM-MILK. The stomach of the young calf is very delicate, and all changes should be made gradually. When about two weeks old, the calf, if a strong, vigorous one, can be gradually changed to skim-milk. During the first day decrease the amount of the whole milk one pound and add one pound of skim-milk, and so on each day until the change is complete. Previous to this the calf should have a little grain (corn or Kafir-corn meal, or a mixture of both) placed in its mouth immediately after drinking its milk. In this way it gets a taste of the grain and will soon go to the feed-boxes and eat with a relish.

After the change to skim-milk is completed the amount may be gradually increased as fast as the calf is able to consume it without scouring. Care must be taken not to increase too rapidly. The calf is a greedy animal, and will appear more hungry after drinking its milk than before, and if given too much it will soon be on the sick-list. The milk fed should be weighed or measured at each feeding. Our experience has been that a calf from three to five weeks of age can be fed from ten to twelve pounds daily; from seven to eight weeks old, fourteen to sixteen pounds and when from three to five months of age can be fed eighteen to twenty pounds of milk. The milk should always be fed warm and sweet. Next to overfeeding, there is probably nothing which causes greater difficulty with the hand-fed calves than feeding sweet milk one meal and sour milk the next.

The Importance of Skim-milk. Skim-milk has all the ingredients of whole milk except the fat, as is shown in table I and II.

TABLE I —Composition of skim-milk and whole milk compared.

Ingredients.	Skim-milk, General Average. (Cooke.	Whole Milk. (Babcock.)
Water	90.25 per cent.	87.17 per cent.
Ash	.80	.71
Casein and albumin	3.50	3.55
Sugar	5.15	4.88
Fat	.30	3.69

TABLE II.—Digestible nutrients, per cent.—skim-milk, whole milk. (From Henry's "Feeds and Feeding".)

	Dry Matter in 100 Pounds.	Digestible Nutrients in 100 Pounds.		
		Protein.	Carbohydrates.	Ether Extract.
Skim-milk	9.4	3.9	5.2	0.3
Whole milk	12.8	3.6	4.9	3.7

It will be seen in table II that the percentage of protein in skim-milk is greater than in whole milk, and as protein is what produces bone and muscle, the feeding value of skim-milk is apparent. The fat taken from the skim-milk can be readily supplied in the fat and starch contained in grains. The fat in the milk would go to keep up the animal heat and be deposited in the system. This makes the calf receiving whole milk look plumper and slicker, but no better developed in bone and muscle. Comparing the different experiments that we have conducted in feeding calves on skim-milk, table III has been constructed. In figuring for this table, the calves have been charged with grain at fifty cents per hundredweight and hay at four dollars per ton.

TABLE III—MONEY VALUE OF SKIM-MILK.

Experiment Number.	Number of Calves.	Value of Skim-Milk Per Cwt.		
		When Calves are Worth $3 per cwt	When Calves are Worth $4 per cwt.	When Calves are Worth $5 per cwt.
I	10	$0.24	$0.32	$0.41
II	10	.20	.32	.43
III	10	.24	.36	.49
IV	10	.19	.32	.44
V	10	.16	.27	.38
VI	10	.21	.35	.47
VII	10	.21	.35	.48
VIII	10	.23	.37	.50
IX	10	.17	.29	.41
X	10	.12	.22	.32
XI	10	.17	.29	.41
XII	10	.15	.27	.38
XIII	10	.21	.34	.47
Average.	10	$0.19	$0.31	$0.43

Table III makes a remarkable showing for skim-milk. With calves worth only $3 per hundredweight, skim-milk is worth nearly 20 cents per hundredweight; with calves at $4 per hundredweight, it is worth 30 cents; and at $5 per hundredweight, over 40 cents.

On account of its superior feeding value, skim-milk should be handled and fed with considerable care. Where milk is delivered to a creamery or skimming station, it is a frequent practice to sterilize it by heating to a high temperature, which process destroys the germs. This is to be highly commended, but some care must be exercised in handling this heated milk. Too frequently a can of skim-milk is brought home and set in a tub of cold water, with the expectation of cooling down sufficiently to keep from souring. The result is, that the heated milk heats up the water, and the water cools the milk, and both become in what is known as a lukewarm condition, which furnishes ideal conditions for the development of the souring germs. If hot milk is set in cold water, it should be running water; at least, the water should be changed and the milk stirred sufficiently to cool the latter. By far the best plan is to run the milk over the cooler and then set the cool milk in cold water to keep it cool. Skim-milk treated in this way has been kept from Saturday noon until Monday morning in good condition during the hottest weather of July and August.

SOME PROFITABLE BABY BEEF.

J. W. RATCLIFF, of Fountain County, Illinois in Breeders' Gazette.

As to the car of calves I had on the Chicago market a few weeks ago there were 15 of them in the bunch. Their average age was 12 to 13 months and the average weight 733 pounds in Chicago. They were on full feed all their lives as I commenced feeding them while they were yet sucking the cows and they never knew what it was to be hungry. They were fed shelled corn and oats equal parts unground up to the time new corn would do to feed last fall; then they had new corn till shipment was made. Of course they had good pasture, very good, and plenty of water.

As to the gains this load made I do not know as they were never on the scales till they reached Chicago, although I know they were satisfactory to me. As to the kinds of foods I like best, there is nothing better than good corn, good oats, good pasture and plenty of water. If a man will treat his stock right and keep it growing right from the start he will have no use for any of the stock foods that floods the markets.

These calves were not dehorned and were a cross between the Aberdeen-Angus and the Short-horn. The type of steer I like best for feeding is the short-legged low-down blocky kind. I have been raising and feeding more or less cattle for the last 30 years, and I never attempt to feed out a bunch of them unless I have hogs following them. I consider it a great loss to feed cattle and have no hogs following.

I like best to feed in troughs placed in a pasture field in good weather; when weather is bad I feed in my cattle barn. I do not feed nor handle my stock scientifically, but use good judgment and common sense.

MORE ABOUT BABY BEEF.

JOHN MEHMKEN, DES MOINES, IA., in Breeders' Gazette.

I have before me a letter from a young farmer of Lee county, Iowa. He says he has over 300 acres of land, some creek bottom, some rough pasture with a little timber on it and the rest is fairly flat upland. It has been the custom of his father to buy feeding cattle in summer, run them on blue grass, later through stalk fields, and then put them in the feed lot, to be sent to market when corn was about fed out.

He is not satisfied with the net returns of this plan and asks if it would be more profitable for him to feed calves, and whether he should buy some or raise them, and what I consider a safe price to be paid for a calf at weaning time and of the kind that makes baby beef. He feels somewhat uneasy about overproduction of that article.

It is always easier to give an advice than to follow the same, and I will say that I have seen the advantages of feeding calves long since, but it is now that I am feeding our first load of baby beeves.

It will not do to undertake feeding calves unless one is prepared, and to be prepared means to have plenty and good shelter, a big supply of good roughness, preferably clover hay; oats and corn enough and to spare, also plenty of fresh water and a head, which is carried on one's own shoulders, with a mind in it which has made sure before beginning that calves shall not go to market until finished. This is all important, for it takes a long time to feed a calf to ripeness and one may see many changes in the market during that time, and it may be trying to one's backbone at times to hold on, but we must not overlook the fact that if light cattle are unpopular at times we can make them heavier with little cost; whereas, if heavy cattle are discriminated against and get top-heavy, they must be marketed or fed at a loss. If a man lives in a district where beef calves are raised, and can buy them at weaning time, he should take none but good ones; that is to say, a calf which is sired by a registered bull of one of the beef breeds from as good a cow as possible, and under no circumstances should he knowingly take one which is from a grade bull, even if the latter looks better at weaning time. The calf from a grade may feed all right, but it is very uncertain.

As to prices, it depends much on the calves, and we must remember that good calves can not be produced at a trifle, but nobody should pay an unreasonable price just because the other fellow is doing so.

This young man from Lee county is fortunately located in so far as he lives within driving distance of Fort Madison, Ia., where O. H. Nelson has opened up a feeder market and no doubt will hold some public sales this fall, where he will sell feeding cattle and calves.

Mr. Nelson handles a good class of calves and believes that a satisfied customer is the best advertisement. I bought a bunch of heifer calves from him and Mr. Sotham in 1902 which are of Hereford breeding and mostly of the C. S. brand and a few of the Y. brand. They were Panhandle calves and developed into a grand lot of cows. They have their first calves at foot now, and a very promising lot of calves they are.

I also helped my brother to buy a nice load of yearling Hereford steers from him at Fort Madison which have done well and for uniformity are hard to beat. It is a safe plan for one who intends buying calves at a public auction and is not well posted to let such men as have bought there before buy a few loads, and then buy that class of calves at close to their figure; but never get excited if somebody runs a load up in price out of reason, and we must always remember that Chicago buyers never ask us what we have paid for the stuff at the beginning. An unreasonable price is not desirable for the seller either, as it may cripple the sale, and calves should sell on their merits, which, however, does not always mean size; it is rather in the breeding; but it is better to pay a little too much for a good calf than to take inferior ones because they are to be had for less money. A dollar looks big in the price of a calf, but the good one may outsell the other by $10 to $15 when finished. Let mean ones alone.

Having secured calves we must be very careful in getting them started on a grain feed. To be sure if we see the little things eat we are tempted to give them a little more, but that is wrong; a calf's stomach is small and must be expanded by giving it all the good roughing it wants and a little grain thereafter; but if we stuff it with grain a calf soon feels satisfied and does not eat enough roughness, and of this we must keep it full always and give plenty of water. Grain may be increased slowly or fast according to the time one wishes to finish, but quick finish on a heavy grain ration may check growth.

In my opinion it would be wise for many farmers in the corn-belt to take time by the forelock and buy some of those well-bred range heifers for breeding purposes, as long as they can be had at beef price, and start breeding good beef calves, by the use of pure-bred bulls.

What a sad story is told in a few words, to him who can read between the lines, in your article in issue of Sept. 6 which is headed, "Good Beef Calves Scarce." "Where are the good calves we got so plentifully in former years," a feeder buyer asked, and there were none among his auditors who could throw any light on the problem. I was on the Chicago market some little time ago, with a load of cattle in which I had a few cows which I considered not good enough to raise beef calves and I was surprised to find but very few cows on the market which were of better breeding from the standpoint of the beef maker. The dairy type was predominant, but I saw very good cows in the western division. I had an idea then that it would be lost time to hunt for a load of good calves, and if there had remained any doubt a glance over the bull pens would have soon removed it. I found the content of fourteen pens to be of very miscellaneous breeding, 87 bulls all told, only six of which showed good breeding and about a dozen grades of fairly good quality, and in weight they varied from 600 pounds to a ton, but the bulk weighed less than 1,000 pounds. The range has the best breeding material at present, but will it continue to breed good cattle? I fear not. Conditions are changing in the range country; the land is more and more settled; the settler will raise cattle and will care for them better than the big outfits can do; but will he be willing or able to keep registered bulls? Let us hope so for his own sake and for those of us feeders who have to buy our cattle; but where it is practicable we should raise our own cattle, at least partly so. If we all depend on the range for feeders and many rangemen quit breeding we may be in the same trouble before long where sheep feeders are now. We keep a herd of over 70 head of cows and heifers just to raise beef calves and men often ask me how we can afford to keep cows to raise calves, and if it is not easier and cheaper to buy them. Well, yes; it is easier to buy them; but my, how I would miss the joy of going out on a nice May morning and finding three or four new white-faced babies from our best heifers looking at me in wonder, or to find a set of twins, and what satisfaction there is to see the calves develop just as expected, because of their breeding; and as to buying calves cheaper, no, I can not, because the cows are fed on feed which would mostly go to waste if we should feed only calves and buy them all, and how we would miss the manure, which these cows make in winter while they eat the threshed hay, straw and corn fodder for which we would have no market otherwise; and this manure if spread on meadow and pasture with a manure spreader will double the yield of the crop of grass. I feel most certain that we can not afford to feed calves unless we keep cows to raise them and consume such feed as is not best for calves.

I was much interested in the timely inquiry of Gov. Packard in your issue of Aug. 9 and your answer thereto, more so as I had a load of nice little Hereford cattle on the market that day, short twos weighing about 1,200 pounds. I sold early and well, and after seeing them over the scales I started out to see what was the matter with the trade in baby beef. The first load of that class I saw were Shorthorn heifers weighing 750 pounds and selling at $5; next a load of well-bred Hereford steers weighing 850 pounds at $5.25; then a load of steers of no particular breeding but fat, at $4.65, and weighing around 750 pounds, and some odds and ends at various prices. I was well satisfied that this young stuff sold for fully as much money in comparison with older cattle as anything on the market and made a quick sale. The heifers at $5 were well-bred and very fleshy and sold at top of their class; the little Herefords, while nice, would have been better with two months' longer feeding, but sold better than older cattle in the same flesh and they would likely have brought 50 cents more per 100 pounds in two months and would have weighed 150 pounds heavier; and where they did not quite bring $45 then, they would likely have made $60 in a short while. On the other hand there was that load of indifferent breeding; they were fat but should not have been fed for baby beef. They evidently had a lot of good feed and good care, and it seemed a pity that so much care and feed should have been wasted, for they sold for less than $35, whereas the Herefords, with less age and in not as good flesh, made $45 per head, and the Short-horn heifers with the same flesh and weight but less age made $37.50. The man who fed the common load went home perhaps asking himself, "What is the matter with the trade in baby beef?"

Many yearlings have been marketed this summer before they were finished, and what effect this premature marketing will have on next year's crop is a matter of speculation, but three things seem reasonably sure: first, a broader demand, because a very big part of the crop was marketed during a short period, and was thus forced over more territory than ever before and acted as an educator for the consumer (though it was a costly lesson for the producer), whereas conservative marketing would have caused it to flow through much the same channels; second, a better class of calves will be put in the feed lot this fall to be better sheltered and cared for and fed to a better finish; and third, it will keep many a man from trying again who was tempted by last year's good demand and prices to think that the making of baby beef was an avenue to sudden wealth, but having no experience or proper accommodations came out at the little end of the horn; and such men are mostly the ones to cut loose as soon as the market breaks and so make matters worse. Unless a man is able to shut his eyes at times and go on feeding in spite of what others think or say or do he should not undertake to feed calves for baby beef.

AN ILLINOIS FEEDER'S METHOD.

THOS. F. CRAWFORD, Rock Island County, Illinois, in Breeders Gazette.

For thirty-five years I have fed from 100 to 150 head of cattle each year, part in dry lot until sold, and the others in February, selling in August or September. The dry lot cattle I like to have of one breed and as even as possible and to average from 1,000 to 1,100 pounds. I place them in the yard about the middle of November and it takes me about one month to get them on full feed. I have a double crib with troughs on both sides and doors through which to shovel corn. There are sheds on both sides of the crib.

After the cattle are on full feed I feed once a day, cleaning the trough before feeding. If I have it I feed clover hay. It is best in my opinion. I break the ears of corn. I think it better to feed whole corn; they do not eat it so fast when fed whole. I keep corn in the troughs all the time, so the timid ones get full feed. If one could have whole fodder I think it the best for a balanced ration. This bunch I like to market from the middle of June to the middle of July. In this time I make a gain of 375 to 425 pounds.

I have a good shed where I feed hay, so that in stormy weather the cattle can all get in. I like to feed four cars in one bunch, although one car will make better gains. If I can I like a hog and a half after one steer. I usually get 200 pounds of pork from one steer.

I have tried different kinds of stock foods and fed them the whole feeding period to one bunch, but made no better gains than when I fed straight corn and clover hay or whole fodder. I look after my cattle every day and feed one bunch myself and my cribs are so arranged that I never load up in wagon to feed. Two of us feed 150 cattle and do a good lot of other work. Other parties I know have ground feed and feed shelled corn, but I do not know the one who has put on more pounds thereby.

I like a lot for four loads of cattle to contain one to two acres. I keep salt always in the lot. In my experience not so many founder that I have to keep them away from hay or corn by itself. The cattle I shipped to Chicago in Angust were a mixed bunch. Some I bought of my neighbors, some in Missouri. They were not all up-to-date. I had Shorthorns and Herefords and some black ones. I got them on full feed March 1. I fed whole corn and hay, breaking the corn, and let them out on 40 acres of good blue-grass on May 15. I kept them on full feed of corn but quit hay and kept them on fullfeed of corn until shipped They made 400 pounds' gain. There was a barrel of salt in the yard I never keep track of their weight, for I find the more quiet I keep them the better they do. I think for winter feeding long twos or coming threes the best, for they have their growth and can stand the rigors of winter better, but for summer I like long yearlings.

You may ask why I feed whole corn. They cannot get their fill so quickly and they get exercise which all animals need, whether they walk on four feet or two.

I have tried all kinds of cattle separate and together but the cattle all over this country are mixed. The best bunch of cattle I ever fed, about 30 years ago, were mostly picked roan Short-horns. As to the question of whether I find trouble in getting good feeders, I will say that we do, for the breeds are so mixed and crossed it is hard to find them. If a man has to pay for a farm it does not pay to raise calves on $150 land.

AN ILLINOIS FEEDER'S EXPERIENCE.

WM. CHESNEY, JR., Bureau County, Illinois, in Breeders' Gazette,

With reference to the car loads of steers I sold in Chicago July 10 at $5.75, I would say there were twenty head in the bunch which I think generally makes a nice load of that age and size to feed. They were all about twenty-six months' of age and were nearly all pure bred Angus with th-exception of two or three which were three-quarter Angus. These cattle were gathered up last fall about the first of November when they weighed, as nearly as I can estimate, about 850 pounds and were only running on grass. They were nearly all raised in this country. When I bought them I turned them on to fall pasture and besides let them run in stalk fields after husking till real cold, severe weather set in, taking care all the time that they held their own weight. About December 21 I began feeding them a little corn in the ear with plenty of good hay, still letting them run in the stalk fields as the weather was dry and cold, which last winter held on until about January 20, when we got some heavy snow and then I shut them up in the yard which is an ordinary sized feed lot. I then fed them twice a day corn with a little oats which made a feed of about twelve bushels ear corn and one of oats.

After I had shut up my cattle I selected twelve of my best brood sows and a boar and turned them in with the steers. I allowed them to run and sleep together, and you can understand that the twelve bushels of corn kept the cattle and hogs in good growing condition. I fed the animals this way until about aMrch 21 when I began to increase their feed once a day and at the other end shortened it until I had them on a once-a-day feed. I am a strong believer in the fact hat soaked corn is the best as soon as you can feed it in the spring till late in the fall and that it will produce more fat than feeding corn in the dry state and on the cob. Do not feed cob corn under any circumstances. Shelled corn will keep if you manage it right; is much nicer to feed and a great deal better for your cattle as well as your own comfort and convenience. Of course this is a question that troubles most breeders because corn has been so high in price the last two years and a person has had to use it according to his best knowledge and judgment. Some feeders use oil meal and others cotton-seed meal. The latter has been used here in this neighborhood some the last few months, but for my part I cannot see that it has paid extra well. When you use those feeds your cattle have to gain quite a bit more to justify the expense. I believe alfalfa and clover are as good as anything.

What kind of cattle to feed? I say this: if the feeder is going to buy his feeders on the market buy a sort of common or medium kind. But if you are going to buy them through the country buy the very best. Now why? Well, because the market usually quotes the class that is between the good and the common. There is generally a difference of 25 to 30 cents a hundred between them and in the country you can pick out the best for what they generally ask for the poorest. And when you reach the end you have gained 20 to 30 cents a hundred if your judgment has been good enough to select uniform size, color and weight. The Hereford is a good beef breed. Do not pick out a white steer and leave a good red or roan Shrt-hrn nor a Jersey and leave an Angus. I think it a good plan to first consider the color, then a good back and hind quarters. Above all select a steer with a good muzzled jaw. I think the latter a very important point. The Herefords and Shorthorns generally have a deep, wide muzzled jaw, also the Angus, but not so with the Jersey, Holstein and dairy breeds. The animals' food must always be well masticated and mixed with saliva or it cannot be easily and quickly digested. Almost every farmer knows that the hog which has the heaveist jowls is the best feeder and so with beef cattle. We all ought to be careful what kind of cattle we raise and feed, because it is for the interest of the grain raiser, the feeder, the consumer and also the man who sells the meat off the block.

The above mentioned cattle weighed in Chicago 1,287 pounds and gained a little better than two pounds a day winter and summer. I fed young cattle because the market seemed to be better in hot weather for light handy weight stuff. I raised fifty pigs from the twelve sows and I did not have to feed them scarcely anything while they followed the cattle. After March 21 they had some shelled corn (soaked) put into their troughs every evening.

TWO POUNDS A GOOD GAIN.

CHARLES MONSON, FREMONT COUNTY, IOWA, IN BREEDERS' GAZETTE.

With reference to the seven car loads of cattle I had on the Chicago market the first week in November I would say the entire bunch consisted of 110 head and they fetched $5.80. That may seem rather high, but take the prices of feed, and everything into consideration, they did not make a great deal of money. They were on feed eight months. I bought them in Kansas City last December. They were of mixed breeding and were two years old. They gained fifty pounds a month and were dehorned. They were a good blocky bunch of feeders. And right here I would like to say a few words about gains. I have read a great deal about big gains on steers but as far as my twenty years of continued experience goes an average of two pounds a day is the best that I could do and I think I am as well fixed to feed cattle as anybody in this part of the country. My cattle feed from a self feeder and have plenty of grass and pure well water. The fore part of the season the above cattle ate ear corn, the latter part they had shelled corn and some oats mixed in. They had their own way about going into pasture or into the yard to the water and they had salt by them all the time. I always see to it also that the bunks are kept clean, and that corn is drawn to them all the time. I generally have enough hogs following to keep all waste cleaned up. Our farmers buy most of their feeders in Omaha and Kansas City. There are very few good steers raised around here. The size of my feed lot is about two acres. I have it divided into two lots. I have been feeding cattle in summer and winter, but I am not going to feed this winter. The outlook for good cattle is a puzzle.

BEEF PRODUCTION AND DEMAND.

CHARLES ESCHER, SR., CARROLL COUNTY, IOWA, IN BREEDERS' GAZETTE.

On my return from another International I could not help wondering over the improvements which are made year after year, especially the great amphiheatre which to my notion is an ideal for its purpose and in its accommodations. The show certainly ought to be of great educational value to the visitor. As long as I am able to be around I shall take an interest in the production of beef, to which I gave most of my time and attention again this year, although not showing anything myself. I learned again this year that a yearling bullock can not be brought to a finish of perfection as well as a two-year-old, and as the feeding of cattle is the final end it should behoove every feeder to do his very best. But whether we will be able to bring them much better than what has been done in the last three or four years is a question. I know I did all a man could possibly do last year with the yearling I showed when I put over 800 pounds on in twelve months time. Surely every fair-minded person had to acknowledge this year again that the different beef breeds were all of a prime character, but here is the question; did it pay the men who worked and toiled for a whole year with a carload of steers, which were the plums, perhaps, out of a drove at least of 100 head? While some perhaps do not pay the strictest attention to them, I know only too well that others spend labor enough on theirs so it would have kept a man busy for a year at least.

And what was the reward? There is no business of any kind carried on where the men have so little to say as the stockraiser in these days. If the money invested was to be considered, millions on top of millions have been lost in the last three years in cattle feeding. For one thing, feed has been too high, and where the feeder lost the man who sold his corn at 40 cents did all right; but to say he had the gain, or made what the feeder lost, is not so, because where land is from $75 to $100 and even more, besides labor is high, who can raise corn for much less?

A few weeks ago I saw an article wherein the feeder was told how important it is to know what not to do. And then it gave a way to avoid the evils of so many losses in cattle feeding—namely, the man must know what to buy for summer feeding, as also for winter feeding; the light cattle for spring and summer months and the heavy for fall and winter months. To which question I gave considerable thought.

Now the matter of the fact is this: If the farmer or feeder always knew what not to do, Chicago would not be burdened with 35,000 to 40,000 cattle a day, as on one morning two weeks ago, which was just the time when heavy cattle, such as Christmas beeves, were wanted. The "Drovers' Journal" had this to say: 'The heavy cattle were neglected, and a decided drug on the market.' "

Now how is a fellow to know what not to do? My experience in late years is this: I seldom go to market and have what is wanted, no matter summer or winter. It is either too heavy or not finished enough, and a person is reminded of the man who sits down at the dinner table with no taste—nothing is good enough. And so the market; when glutted the buyers are independent, because there is a flood of cattle to pick from.

Here are problems which confront the farmer and stockraiser, and must be solved before long. This state of affairs cannot last long else the feeders go bankrupt, which has been the case with hundreds in the last three years. After hard work and slavery for a whole year with feeding from 300 to 500 head of steers, from $5.000 to $8,000 have been lost, and it did not only get the new beginner as a dule is called green, no; it got the best of them as well.

But as everything has its time, so I look for a change. I have noticed this in my time, that no matter what the business is, if legitimate it will have its inning some day. It is very gratifying to the farmer to notice that some of our best agricultural papers have taken the stand for the farmer's interest and insist on having some legislation which heretofore has been neglected or ignored by our law-makers, who have rather given attention to the millionaires' interest in the eastern states. than to the men by whom they were elected in our agricultural states. But no wonder. The western granger was easily bought some years ago, when our politicians preached all over this country for protection against pauper labor, telling the farmer that if the wheels and spindles were kept turning in the United States so the working classes had plenty of money to buy with, our products would all save 5 per cent be consumed at home. This of course would be to the farmer's interest as he would get a big price for all he raised, but we must steer clear from pauper labor, which the old countries had, said these politicians. Now this song of protection was very sweet to the farmer's ear, but it was soon learned that it did not work as does the golden rule, both ways, no; it worked only one way. The men who could talk iron, steel, coal lumber and even oil were strictly in it, but the fellow who had kept hold of the plow and filled his graneries was told one morning on his way to market that everything had dropped in price at the Liverpool market, by which of course our markets were all governed. This was a surprise to the granger, because he had voted to protect himself from pauper labor. Now he had maneged and raised his produce in a high-priced wage country and had to place his produce right alongside the pauper laborer's goods; and lo, the poor fellow had nothing to say, but was told if that did not suit he could take his stuff and go; so all there was left for him to think about was this: I am cheated.

These are the conditions with the American farmer to day in a large measure. His interest has been neglected or ignored. The railroad rates as everything else are fixed at a paying basis to which he has nothing to say. But the old saying still goes: "It is a long lane which has no turn."

THE FUTURE OF SHORT-HORN.

MARTIN FLYNN, DES MOINES, IA., BEFORE CENTRAL SHORT-HORN ASSOCIATION.

About thirty-seven years ago, having just purchased my Walnut Hill Farm, I observed the native cattle on the farm and those owned by my neighbors and at once realized that an improvement must be made. I began to investigate the merits of thoroughbred cattle. My preference was the Short-horn breed. I soon purchased the foundation stock of the Walnut Hill herd. I then believed, and during all these years have had no occasion to waver in that belief, and, in fact, am today more thoroughly convinced that the Short-horn is the greatest improver of the cattle known to man, and we, Short-horn breeders may justly feel proud of our chosen breed when we go through the stock yards and see on the market so many of the best fat cattle carrying Short-horn blood, and how small is the per cent of the good fat cattle sold for beef that does not carry the blood of the Short-horn. We must not, however, forget that our principal mission is to breed a class of bulls that will improve the common cattle and bring them to the point demanded by the butcher. We are not breeding our thoroughbreds for the butcher's block but for the production of bulls to improve the beef qualities of the common cattle. Hence, we must not overlook that great essential now so urgently demanded of the stock raiser, viz., size, because the sire put on common cattle must have size as well as smoothness.

I believe in the matter of scale lies the great mission of the Short-horns as a beef breed. We know that sires of other beef breeds will, when used on the common cattle, produce smoothness and quality, but they will not sufficiently increase the size. The thoughtful range man who has been using sires of the other breed is frequently heard to say, "My cattle are too small; I must use a Short-horn cross to increase the scale."

Now, my fellow Short-horn breeders, we must stop and consider the conditions that today confront us. Can we afford to sacrifice the scale of the Short-horns in an effort to breed sires that will produce the small, early-maturing baby beef class? Other beef breeds are putting forth their most strenuous efforts in this line, and, we must admit, with average success; but it is not a fact that field is very small, for reasons that do and must exist for many years to come? To successfully finish for market beef at from twelve to twenty months old, the calf must be kept growing constantly and never allowed to shrink or lose the calf fat. The calf must be of a high grade of good quality and a strong beef type, and to be kept growing it must be fed much more carefully than the older steer, and a properly balanced ration must be fed, so that the bone, flesh, and fat will be developed proportionately. Such beef cannot be finished quickly by short feeds and only the very best feeds of the farm can be used."

To economically market beef it must be produced in car load lots. Now, how very few farms will yearly produce a car load of such calves. And here lies the great difficulty. From the very nature of the business to be successful the feeder should have baby beef under his own management from the very early days of calfhood until it is thoroughly finished. So we may conclude that, notwithstanding the knowledge that a given amount of feed will produce a greater gain in the young animal, so much care, thought, and technical knowledge is required and such feeding is surrounded by so many precise conditions that its production will be left to a few feeders whose location, circumstances, and equipment make finished baby beef successfully possible.

The great army of farmer feeders will still continue to fit the mature steer for market at from two and one-half to three years old, and the great bulk of the demand will continue to be for large steers of quality, weighing, when finished at this age, from 1,300 to 1,500 pounds. When we consider the farmer's conditions, this is the steer that pays him best. As a calf it is raised on skimmed milk (the butter fat having been sold to the creamery) and a little grain ration. The second year's growth is made on grass and the roughage of the farm, such as cornstalks, straw, etc., that without stock cattle would go largely to waste. Therefore I believe we should think this matter over very carefully and avoid the extremes of the baby beef proposition. My conclusions are based at my own experience. For more than thirty years I have fed steers for the market. I have always bought yearlings of the best quality I could find, let them grow on grass and the roughage of the farm until two to two and one-half years old, then put them in the feed lot with hogs to follow, fed them a grain ration—mainly corn—from three to six months, and as a whole this feeding proposition has been a paying one and my large steers of good quality brought the best returns.

I believe the essentials of the Short-horn sires are, in a general way, perfect health, a good strong back, well sprung ribs large heart girth broad chest, broad head, and prominent eyes, which denote prepotency. He should weigh upward of a ton at maturity in good breeding condition, should stand well on strong legs, and be such that will look over the fence, and with all have a good Short-horn pedigree that traces in all lines to ancestry remarkable for those qualities, that have been bred and reared by men of undoubted intelligence in the mating and raising of Short-horn cattle. Such a sire, when properly handled, will undoubtedly improve the herd on the right lines.

The breeding cows of the herd should be strong, healthy, breedy cows, and for the best interest of both breeder and the breed, more attention should be paid to the milking strains of the dams. The heifers and the deep milking matrons of the herd should be seclected and they should be trained by the most improved methods for developing dairy cows—such as taking their first calves away from them at from three to six days old, milking the young cows by hand and feeding them the most approved dairy rations. The udder of the cow will not properly develop when she is raising her calf, especially if the calf is allowed to run with her, because the calf nurses so frequently the udder is not allowed to fill to a point of extending and developing it.

I do not mean that the dairy type of heifer should be selected, nor do I mean that the dairy type should be developed for show or prize winning dairyy Short-horns; but we can select good milkers, of good beef type, that will be revenue earners from the dual purpose standpoint, a class of Short-horn cows that will produce bulls such as can transmit the milking qualities of their dams as well as having the characteristics of a good sire to improve the beef cattle, thereby making the Short-horn grade a cow most desired by the farmers and dairymen; in fact, making the Short-horn grade the only class of unregistered cattle the farmers can afford to keep.

This is not a matter of theory with me, but it has been demonstrated at the Walnut Hill Farm during the summer of 1904. At three days of age the calves were taken from two Short-horn heifers. These two calves are thick-fleshed, beefy, blocky calves to show ring merit. The heifers were put in a good pacture and given a grain ration consisting of corn and cob meal, wheat bran, and oil meal, were milked twice daily and their milk carefully weighed and tested by a Babcock tester for a period of forty-two days. No. 1 gave a total of 1,327 pounds of milk, averaging 4.1 per cent of butter fat. No. 2 gave 1,681 pounds of milk, averaging 3.8 per cent of butter fat.

The mature cows of the herd, if such as should be kept for the breeding merits of a good herd, will raise their calves during the grass season without a grain ration, but should have a good pasture with access to pure, clean water, and shade if possible. It is a mistake to believe that good, strong Short-horn cows will not stand the cold and hardships of our northern winter just as well as any other cattle, because, having raised their calves during the grass season they will, if dry in the winter, do well and keep strong with the same care that the careful farmer gives his grade cattle. The young mothers raising calves, especially the heavy milkers, should be given a light grain ration in addition to grass during the grass season, such as corn and cob meal, wheat bran, oats, or wheat ground coarse.

The young herd should be developed by good and sufficient care with plenty of milk as calves and a proper grain ration as soon as they are old enough to eat grain. During calfhood is the best time to develop good cattle. They can then, and then only, as a general rule, be crowded without injuring their usefulness as breeders. I find that young bulls need even more care than the heifers; although they will not put flesh on so rapidly when turned out during a good part of twenty-four hours, plenty of exercise is necessary to develop the young sire and essential to his future usefulness and vigor as a breeder. The entire herd must be healthy, must receive intelligent care, and all anmials not in perfect health nor free from contagious or infectious diseases should be entirely excluded from the breeding herd. Under these conditions, and with this care, Short-horns will improve.

The most popular method of disposing of the surplus pure bred cattle of the herd is, no doubt, the public sale, and nearly every young breeder buys his foundation stock at these sales; therefore every effort of the honorable breeder should be made to protect the buyer, and only such public sales should be encouraged by Short-horn breeders as are made and managed by men who have at heart the best interests of the breed. The best interests of the breed demand that every individual or association of breeders should, in selecting the sale cattle, always keep in mind the golden rule; that is, only select for the sale such females as have proven good, reliable breeders—heifers from good dams—and specially all should be healthy and free from any contagious disease.

I believe a great deal of confusion and misunderstanding would be avoided if the American Short-horn Breeders' Association would officially state what is the proper warranty that would be fair alike to both seller and buyer, and use every possible effort to see that the provisions of same be carried out by Short-horn breeders.

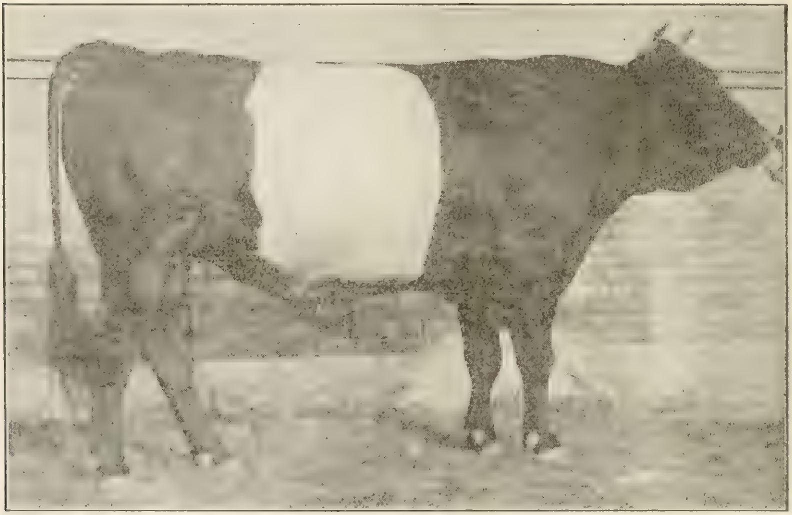
Thus I think a few improvements for all the thoughtful breeders to keep in mind are to increase the sale of the Short-horn sire all that is possible, consistent with quality and smoothness, thereby keeping the Short-horn where it belongs—the improver of all other breeds of cattle. Keep in mind the value of the milking demand, giving to the farmer a revenue from both milk and beef, and thereby place the Short-horns where they have no other competition—a dual purpose breed. Raise the standard of the public sale to a place where any beginner can go and purchase the best Short-horns, knowing that they will do him good. And let intelligent American Short-horn breeders join in an effort to make American Short-horns the best cattle on earth.

DUTCH-BELTED CATTLE.

BY PROF. R. M. WASHBURN, COLUMBIA, MO., IN SUCCESSFUL FARMING.

The Dutch-Belted cattle originated in Holland some time prior to the 17th century. They are the outcome of scientific breeding and selecting, carried on through many generations. The name is derived from the peculiar marking of the animal, she being all black save for a broad band or belt of pure white which encircles her body.

There are so few of these cattle, and, these few owned by the nobility of Holland, that they are not well known either in this country or in Europe. The first recorded importation to this country was made in 1838 by D. H. Haight of Goshen, N. Y. Their distribution has been slow and southward rather than north because of their lack of pronounced hardihood. Though probably related to the Holstein and resembling her in most respects she is not so large and not so free a milker. She is a fair grazer on good pasture but lacks that independence and vigor which marks the Ayrshire and Brown Swiss.



David Harum No. 393. Prize winning Dutch Belted Bull at St. Louis Exposition owned by J. W. Swab, Findlay, Ohio.

When crossed upon native stock they show their strong breeding by marking the young with the white band. They cannot be said to be good feeders nor are they strong breeders. They seem to have been refined to the point of injury to their constitution. Tho' a fairly good dairy cow on rich pastures it is doubtful if they will ever become popular in this country.

VENTILATION OF COW BARNS.

EXCHANGE.

If the farmers in the northern states wish to avoid the introduction of tuberculosis into their herds, or to prevent its further spread when once introduced, it is absolutely imperative that they provide better ventilation in their barns, and especially in their cow barns. It is no secret to intelligent men that while tuberculosis is decreasing in the human family it is increasing among live stock in all those sections of the country all the world over where said live stock spend a considerable portion of the year in barns. One reason why it is decreasing in the human family is because physicians now thoroughly understand that it is not hereditary but a germ disease. The two lines of policy adopted for the treatment of the disease are, first, the destruction of the sputum containing the germs, and, second, keeping their patients as far as possible in the open air and well nourished. Since these methods have been adopted, together with better ventilation of dwellings and an ample supply of nutritious food, the disease is rapidly decreasing. There are, however, enough of the germs in the human family and in the live stock of the country to insure its spread wherever either human beings are kept in improperly ventilated houses or live stock in improperly ventilated stables.

The reasons for this are obvious to any man who will do a little solid thinking. Pure air is quite as necessary to health as either food or water, and therefore whenever a large number of animals are massed together in close stables ample provision must be made both for getting pure air in and the impure air out. The vital element of air is the oxygen. Four-fifths of the air is nitrogen, used apparently to dilute the oxygen; otherwise the striking of a match would set the world on fire. Air once breathed is deprived of this oxygen and unfit for breathing again, and will not sustain life. When air is expelled from the lungs this oxygen has been replaced by carbon dioxide or carbolic acid gas, moisture, ammonia, and organic matter; still further when ventilation is imperfect, bacteria and other disease-producing organisms multiply in the stable.

The animal in the stable throws off through the lungs and pores a very large proportion of its food and drink in the form of invisible vapor. Consequently the air becomes damp and this interferes with the proper action of the lungs and skin. Whenever moisture accumulates on the walls and ceilings or floors, it is an unmistakable evidence that the stables are insufficiently ventilated. Whenever the farmer on opening his stable door on a cold winted morning is met by a cloud of steam, he may know that his barn ventilation is imperfect and that if he has a case of tuberculosis it will speedily spread through his entire herd.

Thus far we are looking at it purely from the farmer's standpoint. Here is another view: The consumption of milk is increasing every year, even more rapidly than population, for whole milk is now one of the cheapest articles of food. The public therefore has some right in the matter, and the poor babies that have to subsist on sow's milk are entitled to the consideration of every man who keeps cows, whether the milk is consumed by his own chilren or by the children in the towns and cities. First-class milk cannot be produced in an improperly ventilated stable.

The ventilation of the stable involves some expense and some thought as well; but laying aside all moral considerations and all consideration for the health of the cattle, the money spent in ventilation will pay in dollars and cents better even than the same amount expended in feed for the live stock. All that is necessary to secure ventilation is to put a flue in the barn made of galvanized iron, or of well seasoned wood, air-tight, commencing within a foot of the floor and extending up through the building above the cone of the roof. A flue of this kind two by two feet on the inside wil furnish ventilation for twenty cows. It is quite as necessary to furnish an inlet for the air as an outlet.

The reason why the ventilating tube should reach the floor is that carbon dioxide and other impurities are heavier than the iar, and hense fall to the floor and are carried out in an air-tight ventilating tube, because the air in the stable is of a higher temperature and therefore lighter than the air outside. In other words, the ventilating flue acts precisely as the chimney of an old-fashioned fireplace. The air should be admitted not through cracks or open doors or knot holes, but through other flues at the top of the stable instead of the bottom,, and should be admitted in several places in order to prevent drafts.

It is not necessary for the cow stable to be more than eight feet high, Eight is better than nine, because with pure air admitted there is no necessity for a high ceiling. In constructing barns it is comparatively easy to make provision both for letting the air in and getting it out. It is more costly to insert these ventilating tubes in old barns or stables; but ventilation should be secured regardless of expense. It will save feed; will add largely to the comfort of the animal; will largely prevent tuberculosis and other dangerous diseases. and will go far to supply wholesome milk for consumption at home and elsewhere.

The present article is simply for the purpose of calling the attention of our readers to this exceedingly important subject. In future issues we will go into the subject more fully, and point out methods by which ventilation can be secured at the minimum of cost. We consider this a matter of vital importance to every farmer.

EYE DISEASE OF CATTLE.

BREEDER'S GAZETTE.

So-called pink-eye—properly termed contagious ophthalmia—presents the following effects:

Symptoms.—Adult, young cattle and calves first show swelling of the eyelids acompanied by weeping. Redness of membranes of eyelids and "haw" becomes apparent, creamy discharge follows and in three or four days a clouded spot shows in center of eye and gradually spreads until sight of eye becomes milk-colored. Changing from milk-color to pearl tint the eye may become yellow, bulge, show bloodshot streaks, form an abscess and burst, leaving a ragged ulcer, or commence to clear up and finally recover. Slight ulcers may heal by granulation, but extensive ruptures and ulcers often lead to loss of sight. Fever and some loss of appetite are present, especially in young cattle, for a week or more from time of first attack and dairy cows may shrink in milk production.

Treatment.—The disease being "catching" and doutbless due to a germ which leads to its spread from one animal to another, affected cattle should be separated from unaffected. The eyes of the latter should be washed once or twice a week with a solution of two drams of boracic acid in a pint of water as a possible preventive, and pastures bordering on rivers, ponds and sloughs should be abandoned as the disease seems most liable to attack cattle grazing on such low wet ground.

Place affected cattle in a darkened shed or stable. Give each adult animal a one-pound dose of epson salts with one ounce of saltpeter and one ounce of ground ginger root in two quarts of warm water as one dose and follow with a tablespoonful of saltpeter twice daily in drinking water or soft food. Younger cattle should have the same medicine in smaller doses according to age and size. While under treatment do not feed grain but give soft and green food; allow all the cold water animals will take.

At the commencement of an attack puff between eyelids by means of a clean insect powder bellows a mixture of equal parts of finely powdered calomel and boracic acid; or cover eyes with soft cloth to be kept wet with a 1-2000 solution of bichloride of mercury (corrosive sublimate.) This treatment may prove sufficient in a majority of cases, but should the disease persist and aggravate, substitute for above lotion one consisting of a dram each of sulphate of zinc and fluid extract of belladonna leaves, with 20 drops of carbolic acid in a quart of clean, soft water, with which to keep cloth over eyes continually wet.

When inflammation subsides should the eye remain milky-appearing paint once daily with 1-1000 solution of bichloride of mercury or 3 per cent solution of boracic acid. In bad cases which are tardy in responding to treatment give (except to pregnant cows) one dram of iodide of potash twice daily for adult animal and from ten to twenty grains for calves and yearlings, continuing its use for one week. Ragged ulcers may with benefit be painted with a solutionn of three grains of nitrate of silver in an ounce of distilled water two or three times a week. Lastly, quarantine animals bought at stockyards shipped in or from infected herds.

DISEASES OF THE STOMACH AND BOWELS OF CATTLE.

By A. J. MURRAY, M. R. C. V. S.

U. S. DEPT. OF AGR'L BULLETIN.

[Revised in 1904 by Leonard Pearson, B. S., V. M. D.]

ACUTE TYMPANITES (HOVEN, OR BLOATING).

This disease is characterized by swelling of the left flank, and is caused by the formation of gas in the rumen, or paunch.

Causes.—Tympanites may be caused by any kind of food which produces indigestion. When cattle are first turned into young clover they eat so greedily of it that tympanites frequently results; turnips, potatoes, and cabbage may also cause it; middlings and corn meal also frequently give rise to it. In this connection it may be stated that an excessive quantity of any kind of the before-mentioned foods may bring on this disorder, or it may not be due to excess, but to eating too hastily. Sometimes the quality of the food is at fault. Grass or clover when wet by dew or rain frequently disorders digestion and brings on tympanites; frozen roots or pastures covered with hoar frost should also be regarded as dangerous. When food has been eaten too hastily, or when it is cold and wet, the digestive process is imperfectly performed, and the food contained in the paunch ferments, during which process large quantities of gas are formed. The same result may follow when a cow is choked, as the obstruction in the gullet prevents the eructation, or passing up, of gas from the stomach, so that the gas continues to accumulate until tympanites results.

Symptons.—The swelling of the left flank is very characteristic, as in well-marked cases the flank at its upper part rises above the level of the bankbone and when struck with the tips of the fingers emits a drum-like sound. The animal has an anxious expression, moves uneasily, and is evidently distressed. If relief is not obtained in time, it breathes with difficulty, reels in walking or in standing, and in a short time falls down and dies from suffocation. The distention of the stomach may become so great as to prevent the animal from breathing, and in some instances the case may be complicated by rupture of the stomach.

Treatment.—If the case is not extreme, it may be sufficient to drive the animal at a walk for a quarter or half an hour; or cold water by the bucketful may be thrown against the cow's sides. In some cases the following simple treatment is successful: A rope or a twisted straw band is coated with pine tar, wagon grease, or other unsavory substance, and is placed in the cow's mouth as a bit, being secured by tying behind the horns. The efforts of the animal to dislodge this object result in movements of the tongue, jaws, and throat that stimulate the secretion of saliva and swallowing, thus opening the esophagus, which permits the exit of gas, and at the same time peristalsis is stimulated reflexly. In urgent cases the gas must be allowed to escape without delay, and this is best accomplished by the use of the trocar. The trocar is a sharp-pointed instrument incased in a sheath which leaves the sharp point of the trocar free. In selecting the point for using the trocar a spot equally distant from the last rib, the hip bone, and the transverse processes of the lumbar vertebrae must be chosen. Here an incision about three-fourths of an inch long should be made with a knife through the skin, and then, the sharp point of the trocar being directed downward, inward, and slightly forward, is thrust into the paunch. The sheath of the trocar should be left in the paunch so long as any gas continues to issue from it. If the canula, or sheath, of the trocar is removed while gas is still forming in the paunch and the left flank becomes considerably swollen, it may be necessary to insert it again. It is well, accordingly, to observe the canula closely, and if gas is found to be issuing from it, it should not be removed. When gas issues from the canula in considerable quantity the sound accompanying its escape renders the exact condition obvious. It is occasionally necessary to keep the canula in the stomach for several hours. When this is necessary a piece of stout cord should be passed around the neck of the canula immediately below the projecting rim, annd then be passed round the animal's body and tied in a secure knot, and a careful attendant must remain with the cow during the entire period that the instrument is in place. The rim surrounding the mouth of the canula should be in contact with the skin. Whenever the person in charge of the cow is satisfied that gas has ceased to issue from the canula the instrument should be removed.

The canula is to be employed only in extreme or urgent cases, though everyone who has had experience in treating indigestion in cattle will realize that he has saved the lives of many animals by its prompt application. When the tympanitic animal is not distressed and the swelling of the flank is not great, or when the most distressing condition has been removed by the use of the trocar, it is best to resort to the administration of internal medicine. Two ounces of aromatic spirits of ammonia should be given every half hour in a quart of cold water, or half an ounce of chloride of lime may be dissolved in a pint of tepid water and the dose repeated every half hour until the bloating has subsided. It is generally necessary to give a dose of purgative medicine after bloating has subsided, as animals frequently show symptons of constipation after attacks of indigestion. For this purpose 1 or 1½ pounds of Glauber's salts may be used.

CHRONIC TYMPANITES.

Cattle, especially those which have been kept in the stable all winter, are liable to suffer from chronic tympanites. In this form the animal bloats up after feeding, but seldom swells so much as to cause any alarm. The chronic form of indigestion may also follow an acute attack like that previously described. This is also a sympton of tuberculosis in those cases in which the lymphatic glands lying between the lungs are so enlarged as to press upon and partly occlude the esophagus.

Treatment.—Treatment should be preceded by a moderate dose of purgative medicine: 1 pound of sulphate of magnesia or sulphate of soda (Glauber's salts), half an ounce of powdered Barbados aloes, 1 ounce of powdered ginger, 1 pint of molasses. The powder should be stirred up for a few minutes with 2 quarts of luke warm water, then the molasses should be added; and after all the ingredients have been stirred together for about ten minutes, the dose should be administered. It will generally be necessary after the operation of the purgative to give some tonic and antacid preparation to promote digestion, which is imperfectly performed in such cases. The following may be used: Powdered gentian, 3 ounces; powdered bicarbonate of potash, 3 ounces; powdered ginger, 3 ounces; powdered capsicum, 1 ounce. Mix and divide into twelve powders, one of which should be given three times a day before feeding, shaken up with half a pint of whisky and a pint of water. It is also advantageous in such cases to give two heaped teaspoonfuls of wood charcoal, mixed with the animal's feed three times a day. The animal should also go out during the day, as want of exercise favors the continuance of this form of indigestion. If the dung is hard, the constipation should be overcome by feeding a little flaxseed twice daily or by giving a handful of Glauber's salts in the feed once or twice daily, as may be necessary. Roots, silage, and other succulent feeds are useful in this connection. If tuberculosis is suspected as the cause of the chronic bloating, a skilled veterinarian should be employed to make a diagnosis, using the tuberculin test if necessary. Until it is settled that the cow has not tuberculosis, she should be kept apart from the other members of the herd.

DISTENTION OF RUMEN, OR PAUNCH, WITH FOOD.

This form of indigestion is caused by the animal gorging itself with food, and arises more from the animal's voracious appetite than from any defect in the quality of the food supplied to it. The condition is, however, more severe if the food consumed is especially concentrated or difficult of digestion. In cases of this kind there is comparatively no great formation of gas, and the gas which is formed is diffused through the stomach instead of accumulating in a layer in its upper part. On pressing the flank with the closed fist the indent of the hand remains for a short time in the flank, as if the rumen were filled with a soft, doughy mass.

This form of indigestion should be treated by stimulants, such as alcohol, wine, or aromatic spirits of ammonia. But if the treatment applied fails and the impacted or overloaded condition of the rumen continues, it may become necessary to make an incision with a sharp, long-bladed knife in the left flank, commencing at the point where it is usual to puncture the stomach of an ox, and prolong the incision in a downward direction until it is long enough to admit the hand. When the point of the knife is thrust into the flank and the blade cuts downward, the wall of the stomach, the muscle, and the skin should all be cut through at the same time. Two assistants should hold the edges of the wound together so as to prevent any food slipping between the flank and the wall of the stomach, and then the operator should remove two-thirds of the contents of the rumen. This having been done, the edges of the wound should be sponged with a little carbolized warm water, and, the lips of the wound in the rumen being turned inward, they should be brought together with catgut stitches. The wound penetrating the muscle and the skin may then be brought together by silk stitches, which should pass through the entire thickness of the muscle and should be about 1 inch apart. The wound should afterwards be dressed once a day with a lotion and the animal covered with a tight linen sheet, to protect the wound from incests and dirt. The lotion to be used in such a case is made up as follows: Sulphate of zinc, 1 dram; carbolic acid, 2 drams; glycerine, 2 ounces; water, 14 ounces; mix. It is clear that this operation requires special skill and it should be attempted only by those who are competent.

LOSS OF CUD.

It is very common among farmers, when a cow or ox is ailing, to say that the sick animal has lost its cud. If it is meant that the animal does not ruminate or chew the cud, and that it consequently must be sick, no fault can be found with the expression. In most cases, however, the remark is not intended to convey the idea that the animal does not ruminate, but that the loss of cud is a disease in itself; that the cud has actually been dropped from the mouth and lost, and that for this reason the cow can not ruminate. We may here observe that loss of cud is a sympton of suspended rumination, and shows that the animal's digestive functionse are not performed as regularly as usual. It is a sympton of a great many diseases, and when its existence is detected it should lead the observer to try to discover other symptons upon which to base a correct opinion as to the nature of the disease from which the animal suffers.

VOMITING.

This is not to be confounded with rumination, though some writers have advanced the opinion that vomiting is merely a disordered and irregular rumination. It is not of common occurrence in cattle, though it sometimes occurs.

Symptons.—Animals which vomit are frequently in poor condition. After having eaten tranquilly for some time the animal suddenly becomes uneasy, arches the back, stretches the neck and head, and then suddenly ejects 10 or 12 pounds of the contents of the rumen.

After having done this the uneasiness subsides, and in a short time the animal resumes eating as if nothing had happened.

Cause.—The cause of this disordered state of the digestive system in cattle is usually obscure, but has in some cases been traced to a partial closure of the opening into the second stomach or to a distention of the esophagus. It has been found to occur when there was cancerous disease of the fourth stomach, and experimentally it has been shown that a suspension of digestion or great derangement of the fourth stomach produces considerable nervous disorder of the rumen and sometimes vomiting or attempt to vomit.

Treatment.—Easily digested food and plenty of water should be given. Fear and excitement, chasing, or hurrying animals after eating heartily are apt to bring on this result. In order to overcome irritation which may produce vomiting, the following draft should be given: Hydrate or chloral, half an ounce; whisky, 8 ounces; water, 1 pint. The dose must be repeated when the condition of the animal seems to require it. As a rule, treatment is not successful.

DEPRAVED APPETITE (PICA).

Cattle suffering from this disease have a capricious and variable appetite as regards their ordinary food, but evince a strong desire to lick and eat substances for which healthy cattle show no inclination. Alkaline and saline-tasting substances are especially attractive to cattle having a depraved appetite, and they frequently lick lime, earth, coal, gravel, and even the dung of other cattle. Cows in calf and young cattle are especially liable to develop these symptons. Animals affected in this way lose condition, their coat is staring, gait slow, and small vesicles containing yellow liquid form under the tongue; the milk given by such cows is thin and watery. Such animals become restelss and uneasy, as is indicated by frequent bellowing. The disease may last for months, the animal ultimately dying emaciated and exhausted. Depraved appetite frequently precedes the condition in which the bones of cattle become brittle and fracture easily, which is known as osteomalacia.

Causes.—It is generally believed, from the fact that this disease is largely one of regions, that some condition of the soil and water and of the local vegetation is responsible for it. It is more prevalent some years than others, and is most common in old countries where the soil is more or less depleted. Cattle pastured on low, swampy land become predisposed to it. It occasionally happens, however, that one individual in a herd suffers though all are fed alike; in such cases the disease must arise from an imperfect assimilation by the affected animal of the nutritive elements of the food which is supplied to it.

Treatment.—The aim in such cases must be to improve the process of digestion and to supply the animal with a sufficiency of sound and wholesome food. The following should be given to the cow three times a day, a heaped tablespoonful constituting a dose: Carbonate of iron, 4 ounces; finely ground bone or "bone flour," 1 pound; powdered gentian, 4 ounces; common salt, 8 ounces; powdered fenugreek, 4 ounces; mix. In addition to this, 3 tablespoons of powdered charcoal may be mixed with the animal's food three times a day, and a piece of rock salt should be placed where the animal can lick it at will. German veterinarians have had brilliant results from the treatment of this disease with subcutaneous injections of apomorphine in doses of 1½ to 5 grains daily for three or four days.

HAIR CONCRETIONS.

These concretions, or hair balls, result from the habit which cattle have of licking themselves or other animals. The hairs which are swallowed are carried round by the contractions of the stomach and sometimes gradually assume the form of a small pellet, or ball. These increase in size as fresh quantities of hair are introduced into the stomach, which become adherent to the surface of the hair ball. These hair balls are found most frequently in the reticulum, or second stomach, though sometimes in the rumen. In calves hair balls are generally found in the fourth stomach. There are no certain symptons by which we can determine the presence of hair balls in the stomach, and therefore no treatment can be recommended for such cases. In making postmortem examinations of cattle, we have sometimes found the walls of the reticulum transfixed with nails or pieces of wire, and yet the animal during life had not shown any symptons of indigestion, but had died from maladies not involving the second stomach.

INDIGESTION (DYSPEPSIA, OR GASTROINTESTINAL CATARRH).

Tympanites, already described, is a form of indigestion in which the chief sympton and most threatening condition is the collection of gas in the paunch. This sympton does not always accompany indigestion, so it is well to here consider other forms under a separate head. If indigestion is long continued the irritant abnormal products developed cause catarrh of the stomach and intestines—gastrointestinal catarrh. Or, on the other hand, irritant substances ingested may cause gastrointestinal catarrh, which, in turn, will cause indigestion. Hence, it results that these several conditions are usually found existing together.

Causes.—Irritant food, damaged food, overloading of the stomach, and sudden changes of diet may cause this disease. Want of exercise predisposes to it, or food which is coarse and indigestible may after a time produce this condition. Food which possesses astringent properties and tends to check secretion may also act as an exciting cause. Food in excessive quantity may lead to disorder of digestion and to this disease. It is very likely to appear toward the end of protracted seasons of drouth, therefore a deficiency of water must be regarded as one of the conditions which favor its development.

Symptons.—Diminished appetite, rumination irregular, tongue coated, mouth slimy, dung passed apparently not well digested and smelling badly, dullness, and fullness of the flanks. The disease may in some cases assume a chronic character, and in addition to the foregoing symptons slight bloating, or tympanites, of the left flank may be observed; the animal breathes with effort and each respiration may be accompanied by a grunt, the ears and horns are alternately hot and cold, rumination ceases, the usual rumbling sound in the stomach is not audible, the passage of dung is almost entirely suspended, and the animal passes only a little mucus occasionally. Sometimes there is alternating constipation and diarrhea. There is low fever in many cases.

The disease continues a few days or a week in the mild cases, while the severe cases may last several weeks. In the latter form the emaciation and loss of strength may be very great. There is no appetite, no rumination, or peristalsis. The mouth is hot and sticky, the eyes have receded in their sockets, and milk secretion has ceased. In such cases the outlook for recovery is unfavorable. The patient falls away in flesh and becomes weaker, as is shown by the fact that one frequently finds it lying down.

On examining animals which have died of this disease it is found that the lining membrane of the fourth stomach and the intestines, particularly the small intestines, is red, swollen, streaked with deeper red or bluish lines or spotted. The lining of the first three stomachs is more or less softened and may easily be peeled off. The third stomach (psalter) contains dry, hard food masses closely adherent to its walls.

In some cases the brain appears to become disordered, probably from the pain and weakness and from the absorption of toxins generated in the digestive canal. In such cases there is weakness and an unsteady gait, the animal does not appear to take notice of and will consequently run against obstacles; after a time it falls down and gives up to violent and disordered movements. This delirious condition is succeeded by coma or stupor, and death ensues.

Treatment.—Small quantities of roots, sweet silage, or selected grass or hay should be offered several times daily. Very little food should be allowed. Aromatic and demulcent drafts may be given to produce a soothing effect on the mucous lining of the stomachs and to promote digestion. Two ounces of chamamile flowers should be boiled for twenty minutes in a quart of water and the infusion on cooling should be given to the affected animal. This may be repeated about three times a day. When constipation is present the following purgative may be administered: One pound of Glauber's salts dissolved in a quart of linseed tea and a pint of molasses. After this purgative has acted, if there is a lack of appetite and the animal does not ruminate regularly, the powder mentioned in remarks on the treatment of chronic tympanites may be given according to directions. The diet must be rather laxative and of a digestible character after an attack of this form of indigestion. Food should be given in moderate quantities, as any excess by overtaxing the digestive functions may bring on a relapse.

INDIGESTION FROM DRINKING COLD WATER (COLIC).

This disorder is produced by drinking copiously of cold water, which arrests digestion and produces cramp of the fourth stomach, probably of the other stomachs, and also of the bowels.

Causes.—It is not customary for the ox to drink much water at once. In fact, he usually drinks slowly and as if he were merely tasting the water, letting some fall out at the corners of his mouth at every mouthful. It would, therefore, seem to be contrary to the habits of the ox to drink largely; but we find that during hot weather, when he has been working, and is consequently very thirsty, if he drinks a large quantity of cold water he may be immediately taken with a very severe colic. Cows which are fed largely on dry hay drink copiously, like the working ox, and become affected in precisely the same manner. In such cases they are seized with a chill or fit of trembling before the cramps come on.

Symptons.—There is some distension of the abdomen, but no accumulation of gas. As the distention and pain occur immediately after the animal has drunk the water, there can be no doubt as to the exciting cause.

Treatment.—Walk the animal about for ten minutes before administering medicine, as this allows time for a portion of the contents of the stomach to pass into the bowel, and renders it safer to give medicine. In may cases the walking exercise and the diarrhea bring about a spontaneous cure of this disorder, but as in some instances the cramps and pains of the stomachs persist, one may give 1 ounce of sulphuric ether and 1 ounce of tincture of opium, shaken up with a pint of warm water, and repeat the dose in half an hour if the animal is not relieved. In an emergency when medicine is not to be had, half a pint of whiskey may be substituted for medicine, and should be given mixed with a pint of warm water; or a tablesuoonful of powdered ginger may be administered in the same way as the remedies already mentioned.

INDIGESTION IN CALVES (GASTROINTESTINAL CATARRH, DIARRHEA, OR SCOUR).

Sucking calves are subject to a form of diarrhea to which the above designations have been applied.

Causes.—Calves which suck their dams are not frequently affected with this disease, though it may be occasioned by their sucking at long intervals, and thus overloading the stomach and bringing on indigestion, or from improper feeding of the dam on soft, watery, or damaged foods. Suckling the calf at irregular times may also cause it. Exposure to damp and cold is a potent predisposing cause. Calves which are separated from their dams and which receive considerable quantities of cold milk at long intervals are liable to contract this form of indigestion. Calves fed on artificial food, used as a substitute for milk, frequently contract it. Damaged food, sour or rotten milk, milk in dirty cans, skim milk from a dirty creamery skim-milk vat, skim milk hauled warm, exposed to the sun, and fed from unclean buckets, may all cause this disease.

Symptons.—The calf is depressed; appetite is poor; sometimes there is fever; the extremities are cold. The dung becomes gradually softer and lighter in color until it is cream colored and little thicker than milk. It has a most offensive odor and may contain clumps of curd. Later it contains mucus and gas bubbles. It sticks to the hair of the tail and buttocks, causing the hair to drop off and the skin to become irritated. There may be pain on passing dung and also abdominal or colicky pain. The calf stands about with the back arched and belly contracted. There may be tympanites. Great weakness ensues in severe cases, and without prompt and successful treatment death soon folows.

Treatment.—Remove the cause. Give appropriate food of best quality in small quantities. Make sure that the cow furnishing the milk is healthy and is properly fed. Clean all milk vessels. Clean and disinfect the stalls. For the diarrhea give two raw eggs, or a cup of strong coffee, or two ounces of blackberry brandy. If the case is severe, give 1 ounce of castor oil with a teaspoonful of creolin and 20 grains of subnitrate of bismuth. Repeat the bismuth and creolin with blackberry brandy and flaxseed tea every four hours. Tannopin may be used in dose of 15 or 30 grains.

ABORTION, OR SLINKING THE CALF.

By James Law, F. R. C. V. S.,

Professor of Veterinary Science, etc., in Cornell University.

U. S. DEPT. OF AGR'L BULLETIN.

Technically, abortion is the term used for the expulsion of the offspring before it can live out of the womb. Its expulsion after it is capable of an independent existence is premature parturition. In the cow this may be after seven and one-half months of pregnancy. Earl Spencer failed to raise any calf born before the two hundred and forty-second day. Dairymen use the term abortion for the expulsion of the product of conception at any time before the completion of the full period of a normal pregnancy, and in this sense is will be employed in this article.

Abortion in cows is either contagious or noncontagious. It does not follow that the *contagium* is the sole cause in every case in which it is present. We know that the organized germs of contagion vary much in potency at different times, and that the animal system also varies in susceptibility to their attack. The germ may therefore be present in a herd without any manifest injury, its disease producing power having for the time abated considerably, or the whole herd being in a condition of comparative insusceptibility. At other times the same germ may have become so virulent that almost all pregnant cows succumb to its force, or the herd may have been subjected to other causes of abortion which, though of themselves powerless to actually cause abortion, may yet so predispose the animals that even the weaker germ will operate with destructive effect. In dealing with this disease, therefore, it is the part of wisdom not to rest satisfied with the discovery and removal of one specific cause, but rather to exert oneself to find every existent cause and to secure a remedy by correcting all the harmful conditions.

CAUSES OF NONCONTAGIOUS ABORTION.

As abortion most frequently occurs at those three-week intervals at which the cow would have been in heat if nonpregnant, we may assume a predisposition at such times due to a periodicity in the nervous system and functions. Poor condition, weakness, and a too watery state of the blood is often a predisposing cause. This in its turn may result from poor or insufficient food, from the excessive drain upon the udder while bearing the calf, from the use of food deficient in certain essential elements, like the nitrogenous constituents or albominoids, from chronic wasting diseases, from roundworms or tapeworms in the bowels, from flatworms (flukes, trematodes) in the liver, from worms in the lungs, from dark, damp, unhealthy buildings, etc. In some such cases the nourishment is so deficient that the fetus dies in the womb and is expelled in consequence. Excessive loss of blood, attended at it usually is by shock, becomes a direct cause of abortion.

Acute inflammations of important organs are notorious causes of abortion and in most contagious fevers (lung plague, rinderpest, foot-and-mouth disease) it is a common result. Affections of the chest which prevent due aeration of the blood induce contractions of the womb, as shown experimentally by Brown-Sequard. Pregnant women suffocated in smoke aborted in many cases.

Chronic diseases of the abdominal organs are fetile sources of abortion, especially those that cause bloating (tympany of the first stomach) or diarrhea, or the diseases of the ovaries, kidneys, or bladder. The presence of gravel, or stone, in the kidneys, bladded, or urinary canals is an especial predisposing or even an exciting cause in magnesian limestone districts and in winter. The presence of tubercles in the ovaries, the broad ligaments of the womb, and even on the outer surface of the womb itself, must be added as efficient causes.

Fatty degeneration of the heart, a common disease in old cows of improved beef breeds, lessens the circulation in the placenta (and fetus) and, arresting nutrition, may causet abortion.

Indigestions of all kinds are especially dangerous, as they are usually associated with overdistention cf the first stomac (paunch) with gas. As this stomach lies directly beneath and to the left side of the womb, any disorder, and above all an excessive distention of that organ, presses on or affects the womb and its contents dangerously. It further causes contractions of the womb by preventing aeration of the blood. Hence, all that tends to indigestion is to be carefully guarded against. Privation of water, which hinders rumination and digestion; ice-cold water, which rouses the womb to contraction and the calf to vigorous movement; green, succulent grass, to which the cow has been unaccustomed; clover, which has just been wet with a slight shower; all green food, roots, potatoes, apples, pumpkins that are or have been frozen, or that are simply covered with hoar frost; food that has been grown in wet seasons or that has been badly harvested; growing corn, oats, etc., if the animal is unused to them; a too dry food or a too stimulating food (wheat bran pease, maize, and cotton seed) fed too lavishly may, any one of them, induce abortion. The dry and stimulating foods last named bring on constipation with straining, and also elevated temperature of the body, which, in itself, endangers the life of the fetus.

Putrid, stagnant water is hurtful both to digestion and the fetus, and abortions in cows have been repeatedly traced to this source and have ceased when pure water was supplied. Ergoted grasses have long been known as a cause of widespread abortion in cows. The ergot is familiar as the dark purple or black, hard, spur-like growths which protrude from the seeds of the grasses at the period of their ripening. It is especially common in damp localities and cloudy seasons on meadows shaded by trees and protected against the free sweep of the winds. The same is to a large extent true of smut. Hence, wet years have been often remarkable for the great prevalence of abortions. Abortions have greatly increased in New Zealand among cows since the introduction of rye grass, which is specially subject to ergot. As abortion is more prevalent in old dairying districts, the ergot may not be the sole cause in this instance.

The smut of maize, wheat, barley, and oats is fostered by similar conditions and is often equally injurious. It should be added that the ergots and smuts of certain years are far more injurious than those of others. This may be attributed to the fact that they have grown under different conditions, and therefore have developed somewhat different properties, a habit of fungi which has been often observed, or that in certain seasons the cows have been more powerfully predisposed by other operative causes of abortion.

Both ergot and smut vary in potency according to the stage of growth. Doctor Kluge found that the ergot gathered before the grain had fully ripened was much more powerful than that from the fully ripened grain. McGugen found the ergot of wheat more potent than that of rye. It should be added that both ergot and smut are robbed somewhat of their deleterious properties if fed with an abundance of water, so that they may prove harmless if fed with roots, ensilage, etc., whereas they will prove hurtful when fed in the same amount with dry hay. They are also more liable to injure if fed for a long time in succession in winter, though it may be in smaller quantity.

Rust is also charged with causing abortions. That other crytogams found in musty fodder are productive of abortion has been well established. In Germany and France the wet years of 1851, 1852, and 1853 were notorious for the prevalence of abortions. Fodders harvested in such seasons are always more or less musty, and musty hay and grain have been long recognized as a prolific cause of digestive, urinary, and cerebral disorders. Impactions and bloatings of the stomachs, excessive secretion of urine (diuresis), and red water are common results of such musty fodder, and we have already seen that such disorders of the digestive and urinary organs are very liable to affect the pregnant womb and induce abortion.

The riding of one another by cows is attended by such severe muscular exertion, jars, jolts, mental excitement, and gravitation of the womb and abdominal organs backward that it may easily cause abortion in a predisposed animal.

Keeping in stalls that slope too much behind (over 2 inches) acts in the same way, the compression due to lying and the gravitation backward proving more than a predisposed cow can safely bear.

Deep gutters behind the stalls, into which one or both hind limbs slip unexpectedly, strain the lions and jar the body and womb most injuriously. Slippery stalls in which the flooring boards are laid longitudinally in place of transversely, and on which on cleats or other device is adopted to give firm foothold, are almost equally dangerous. Driving on icy ground or through a narrow doorway where the obdomen is liable to be jammed are other common causes. Offensive odors undoubtebly cause abortion. To understand this one must take into account the preternaturally acute sense of smell pessessed by cattle. By this sense the bull instantly recognizes the pregnant cow and refrains from distrubher, while man, with all his boasted skill and precise methods, finds it difficuly to come to a just conclusion. The emnsations from a cow in heat, however, will instantly draw the bull from a long distance. Carrion in the pasture fields or about slaughterhouses near by, the emamations from shallow graves, dead rats or chickens about the barn, and dead calves, the product of prior abortions, are often changeable with the occurrence of aborations. Aborting cows often fail to expel the after birth, and if this remains hanging in a putrid condition it is most injurious to pregnant cows in the near vicinity. So with retained afterbirth in other cows after calfing. That some cows kept in filthy stables or near-by slaughterhouses may become inured to the odors and escape the evil results is no disproof of the injurious affects so often seen in such cases.

The excitement, jarring, and jolting of a railroad journey will often cause abortion, expecially as the cow nears the period of calfing, and the terror or injury of railway or other accidents prove incomparably worse.

All irritant poisons cause abortions by the disorder and inflammation of the digestive organs, and if such agent act also on the kidneys or womb, the effect is materially enhanced. Powerful purgatives or diuretics should never be administered to the pregnant cow.

During pregnancy the contract of the expanding womb with the paunch, just beneath it, and its further intimate connection through nervous sympathy with the whole digestive system, leads to various functional disorders, and especially to a morbid craving for unnatural objects of food. In the cow this is shown in the chewing of bones, pieces of wood, iron bolts, articles of clothing, lumps of hardened paint, etc. An unsatisfied craving of this kind, producing constant excitement of the nervous system, will strongly conduce to abortion. How much more so if the food is lacking in the material matter, and expecially the phosphates necessary for the building up of the body of both dam and offspring, to say nothing of that drained off in every milking. This state of things is present in many old dairy farms, from which the mineral matters of the surface soil have been sold off in the milk or cheese for generations and no return has been made in food or manure purchased. Here is the craving of an imperative need, and if it is not supplied the health of the cow suffers and the life of the fetus may be sacrificed.

Among other causes of abortion must be named the death of the various illnesses of the fetus, which are about as numerous as those of the adult; the slipping of a young fetus through a loop in the naval string so as to tie a knot which will tighten later and interrupt the flow of blood with fatal effect, and the twisting of the naval string by the turning of the fetus until little or no blood can flow through the contorted cord. There is in addition a series of diseases of the mucous membrane of the womb, and of the fetal membranes (inflammation, effusion of blood, detachment of the membranes from the womb, fatty or other degenerations, etc.), which interfere with the supply of blood to the fetus or change its quality so that death is the natural result, followed by abortion.

CAUSE OF CONTAGIOUS ABORTION.

While any one of the above conditions may concur with the contagious principle in precipitating an epizootic of abortion, yet it is only by reason of the *contagium* that the disease can be indefinitely perpetuated and transferred from herd to herd. When an aborting cow is placed in a herd that has hitherto been healthy, and shortly afterwards miscarriage becomes prevalent in that herd and continues year after year, in spite of the fact that all the other conditions of life in that herd remain the same as before, it is manifest that the result is due to contagion. When a bull, living in a healthy herd, has been allowed to serve an aborting cow, or a cow from an aborting herd, and when the members of his own herd subsequently served by him abort in considerable numbers, contagion may be safely inferred. Mere living in the same pasture or building does not convey the infection. Cows brought into the aborting herd in advanced pregnancy carry their calves to the full time. But cows served by the infected bull, or that have had the infection conveyed by the tongue or tail of other animals, or by their own, or that have had the external genitals brought in contact with wall, fence, rubbing post, litter, or floor previously soiled by the infected animals, will be liable to suffer. The Scottish abortion committee found that when healthy, pregnant cows merely stood with or near aborting cows they escaped, but when a piece of cotton wool loged for twenty minutes in the vagina of the aborting cow afterwards inserted into the vagina of a healthy pregnant cow or sheep, these latter invariably aborted within a month. So Roloff relates that in two large stables at Erfurt, without any direct intercommunication, but filled with cows fed and managed in precisely the same way, abortion prevailed for years in the one, while not a single case occurred in the other. Galtier finds that the virus from the aborting cow causes abortions in the sow, ewe, goat, rabbit, and guinea pig, and that if it has been intensified by passing through either of the two last-named animals it will affect also the mare, bitch, and cat.

It does not appear that it is always the same organism which causes contagious abortion. In France, Nocard found in the aborting membranes and the mucous membrane cocci, or globular bodies, singly or in chains, and a very delicate rod-shaped organism by which the disease was propagated and which survived in the womb through the interval between successive pregnancies. The Scottish commission found as many as five separate kinds of bacteria. Bang, in Denmark, found a very delicate rod-shaped organism showing its most active growth at two different depths in nutrient gelatin, and which produced abortion in twenty-one days when inoculated on the susceptible pregnant cow. In America, Chester, of Delaware, and Moore, of New York, constantly found organisms differing somewhat in the two States, but evidently of the same group with the colon germ (*Bacillus coli communis*). These were never found in the healthy pregnant womb, but in the cow that had aborted they continued to live in that organ for many months after the loss of the fetus.

We may reasonably conclude than any microorganism which can live in or on the lining membrane of the womb producing a catarrhal inflammation, and which can be transferred from animal to animal without losing its vitality or potency, is of necessity a cause of contagious abortion. As viewed, therefore, from the particular germ that may be present, we must recognize not one from only of contagious abortion, but several, each due to its own infecting germ, and each differing from others in minor particulars, like duration of incubation, infection of the general system, and the like. In Europe the germs discovered seem to affect the general system much more than do those found in America. Bang's germ caused abortion in twenty-one days; the New York germ, inoculated at service, often fails to cause abortion before the fifth or seventh month.

Symptoms of abortion.—As occurring during the first two or three months of gestation, symptons may escape detection, and unless the aborted product is seen the fact of abortion may escape notice. Some soiling of the tail with mucus, blood, and the waters may be observed or the udder may show extra firmness, and in the virgin heifer or dry cow the presence of a few drops of milk may be suggestive, or the fetus and its membranes may be found in the gutter or elsewhere as a mere clot of blood or as a membranous ball in which the forming body of the fetus is found. In water the villi of the outer membrane float out, giving it a characteristically shaggy appearance.

In advanced pregnancy abortion is largely the counterpart of parturition, so that a special description is superfluous. The important thing is to distinguish the early symptoms from those of other diseases, so that the tendency may be arrested and the animal carried to full time if possible. A cow is dull, sluggish, separate from the herd, chewing the cud languidly, or there may be frequent lying down and rising, uneasy movements of the hind feet or of the tail, and slightly accelerated pulse and breathing and dry muzzle. The important thing is not to confound it with digestive or urinary disorders, but in a pregnant cow to examine at once for any increase of mucus in the vagina, or for blood or liquid there or on the root of the tail; for any enlargement, firmness, or tenderness of the udder, or in dry cows examine for milk; and above all for any slight straining suggestive of labor pains.

In many cases the membranes are discharged with the fetus; in others, in advanced pregnancy, they fail to come away and remain hanging from the vulva, putrefying and falling piecemeal, finally resulting in a fetid dicharge from the womb. According to the size of the herd, contagious abortions will follow one another at intervals of one to four or more weeks, in the order of their infection or of the recurrence of the period of activity of the womb which corresponds to the occurrence of heat.

Prevention.—Weakness and bloodlessness are to be obviated by generous feeding, and especially in aliments (wheat, bran, rape cake, cotton seed, oats, barley, beans, etc.) rich in earthly salts, which will also serve to correct the morbid appetite. This will also regenerate the exhausted soil if the manure is returned to it. In the same way the application of ground bones or phosphates will correct the evil acting in this case through the soil first and raising better food for the stock. The ravages of worms are to be obviated by avoiding infested pastures, ponds, streams, shallow wells, or those receiving any surface leakage from land where stock go, and by feeding salt at will, as this agent is destructive to most young worms.

The tendency to urinary calculi in winter is avoided by a succulent diet (ensilage, steamed food, roots, pumpkins, apples, potatoes, slops), and by the avoidance of certain special causes. Furnishing water inside the barn in winter in place of driving once a day to take their fill of ice-cold water will obviate a common evil. Putrid and stagnant waters are to be avoided. Sudden changes of food are always reprehensible, but much more so in the pregnant animal. Let the change be gradual. Carefully avoid the use of spoiled or unwholesome food.

In case of prevalence of ergot in a pasture it should be kept eaten down or cut down with a mower, so that no portion runs to seed. In case of a meadow, the grass must be cut early before the seeds have filled. The most dangerous time appears to be between the formation of the milkey seed and the full ripening. Yet the ergot is larger in proportion to the ripeness, so that the loss of potency is made up in quantity. The ripe seed and ergot may be removed by thrashing and the hay safely fed. It may also be noted that both ergot and smut may be safely fed in moderate quantity, provided it is used with succulent food (ensilage, roots, etc.), or with free access to water, and salt is an excellent accessory as encouraging the animal to drink. Both ergot and smut are most injurious in winter, when the water supply is frozen up or accessible only at long intervals. The ergoted seed, when thrashed out, cannot be safely sown, but if first boiled it may be fed in small amount or turned into manure. The growth of both ergot and smut may be to a large extent prevented by the time-honored Scotch practice of sprinkling the seed with a saturated solution of sulphate of copper before sowing.

Fields badly affected with ergot, or smut, may be practically renewed by plowing up and cultivating for a series of years under crops (turnips, beets, potatoes, buckwheat, etc.), which do not harbor the fungus and which require much cultivation and exposure of the soil. Drainage and the removal of all necessary bariers to the free action of sunshine and wind are important provisions.

Other precautions concerning separation from cows in heat—a proper construction of stalls, the avoidance of carrion and other offensive odors, protection from all kinds of mechanical injuries, including overdriving and carrying by rail in advanced pregnancy the exclusion of all irritants or strong purgatives and diuretics from food or medicine, and the guarding against all causes of indigestion and bloating—have been sufficiently indicated under "Causes". For protection of the womb and fetus against the various causes of disease, available methods are not so evident. For cows that have aborted in the last prenancy, chlorate of potash, 3 drams daily before the recurence of the expected obortion, has been held to be useful.

TREATMENT OF NONCONTAGIOUS ABORTION.

Although the first symptoms of abortion have appeared, it does not follow that it wil go on to completion. So long as the fetus has not perished, if the waters have not been discharged, nor the water bags presented, attempts should be made to check its progress. Every appreciable and removable cause should be done away with, the cow should be placed in a quiet stall alone, and agents given to check the excitement of the labor pains. Laudanum in doses of 1 ounce for a small cow or 2 ounces for a large one should be promptly administered and repeated in three or four hours, should the labor pains recur. This may be kept up for days or even weeks, if necessary, though that is rarely required, as the trouble either subsides or abortion occurs. If the laudanum seems to lack permanency of action, use bromide of potassium, or, better, extract of *Viburnum prunifolium* (40 grains), at intervals of two or three hours until five or six doses have been given.

PREVENTION AND TREATMENT OF CONTAGIOUS ABORTION.

So far as this differs from the treatment of sporadic abortion, it consists in separation and the free use of germicides or disinfectants.

(1) Separate all aborting cows in isolated building, yards, and pasture, allowing no other cows to have access even to their manure, liquid or solid. Not even breeding ewes, goats, sows, rabbits, or mares should be allowed to go from the isolated to the noninfected premises. Separate attendants and utensils are desirable.

(2) Scrape and wash the back part of the stall and gutter and water it with a solution of 5 ounces sulphate of copper (bluestone) in 1 gallon pure water. Repeat this cleaning and watering at least once a week. This should in all cases be applied to every stall where an aborting cow has stood and to those adjacent. To treat the whole in the same way would be even better, as it is impossible to say how many of the cows harbor the germ. This is the more needful as that in one to three years, if the aborting cow is kept on, she becomes insusceptible and carries her calf to full time. A cow may therefore be infecting to others though she herself no longer aborts.

(3) Dissolve 1 dram corrosive sublimate, 1 ounce each of alcohol and glycerine, and shake this up in a gallon of water, to use as an injection into the vagina and a wash for the parts about the vulva and root of the tail. Being very poisonous, it should be kept in a wooden barrel out of the way of animals or children. Every morning the vulva, anus, back of the hips, and root of the tail should be sponged with this liquid, and this is best applied to the whole herd. A 1 per cent solution of carbolic acid is a good substitute.

(4). When any case of abortion has occurred the fetal membranes must be removed by the hand without delay, and, together with the fetus, destroyed by burning or boiling, or buried deeply, and the stall should be cleansed and watered freely with the copper solution. Then the womb should be washed out with 1 1-2 gallons of the corrosive sublimate solution injected through a rubber tube introduced to the depth of the womb and with a funnel in its outer elevated end. This should be repeated daily for a week. In the case of the other non-pregnant cows of the herd one injection of the same kind should be made into the vagina, after which they need only have their external and tail washed with the solution daily.

(5) Do not breed aborting cows for two or three months, then use a separate bull, injecting his sheath and washing his belly before

and after each service with the carbolic-acid solution. Exclude all outside cows from service by the regular herd sire and, in purchasing breeding animals, subject them to quarantine and treatment before placing them in the sound herd.

As a certain number of the cows will harbor the germ in the womb when treatment is started, it is not to be expected that abortions will cease at once, but by keeping up the treatment the trouble may be got rid of in the following year. As an aborting cow is usually of little use for the dairy, it is best to separate and fatten her and apply treatment to those that remain. In this, as in other delicate manipulations, the stock owner will consult his own interest by employing an accomplished veterinarian and avoiding such as have not had the privileges of a thorough professional education. In addition to the above, the removal of all manure and contaminated litter and the sprinkling of the surface with the sulphate of copper solution is called for. Drains should no less be thoroughly rinsed and disinfected. Milking stools and other implements may be treated in the same way, or with carbolic acid or boiling water. Great care should be taken to guard against bull or cows from an aborting herd or district; streams even may be suspected if there is an aborting herd near by and higher up on that stream. Cows sent to bull from an aborting herd are to be positively denied, and workmen that have attended on such a herd should be required to wash and disinfect their clothes and persons.

NOTE—It is impossible to lay too much stress on the importance of protecting a sound herd against contagious abortion rather than of treating animals already diseased. This consists principally in purchasing animals from clean herds only, in isolating all new purchases and in not breeding to them until they have been proven free from infection, or in disinfecting the genitals of all newly acquired animals for at least a week.

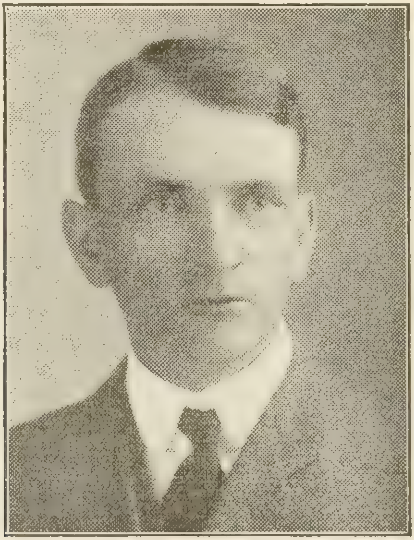
In cases where it is desired to treat pregnant cows to prevent them from aborting, hypodermic injections of 2 drams of a 2 per cent solution of carbolic acid every two weeks until eight injections have been given, may be tried, but too much success should not be expected from this treatment. The most suitable place for the injection is on the side of the neck. Range cattle may be more readily treated by the use of medicated salt placed in troughs accessible to the animals. This salt is easily prepared by pouring 4 ounces of liquefied crude carbolic acid upon 12 parts of ordinary barrel salt, after which they are thoroughly mixed.

THE USE OF THE SCORE CARD IN JUDGING BEEF CATTLE.

BY W. J. RUTHERFORD, IOWA AGRICULTURAL COLLEGE.

The score card as given below, is simply an enumeration of certain points and characteristics regarding early maturity, type, conformation, condition and quality, with valuations for each that go to make up a beef animal.

It was never intended for the judge in the ring, but was devised in order to put system into the study of our domestic animals—for the student in the class-room and for the breeder at home with his herd. The score card alone could never make a judge; that is not its purpose.



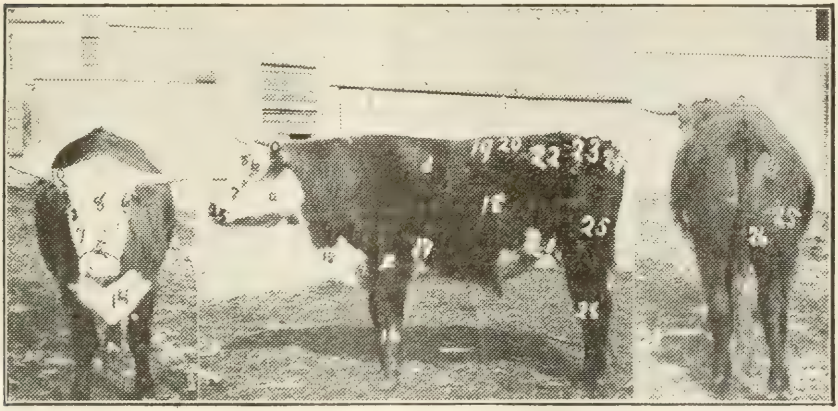
W. J. RUTHERFORD.

The man who has not formed a correct idea of what the beef animal should be is not able to make an intelligent use of the score card. The correct ideal of what the beef animal should be in type, early maturity, conformation, condition and quality is obtained by a careful study of the kind of animal that the market demands.

In order to get a start let us take the student into the class-room, where a good type of beef animal is held for the purpose of demonstration. The student has his score card in hand, and the instructor points out the different parts of the animal in the order named and teaches the student the location of each. It will take a good lesson to impress the student with the location of tongue root, flank, lion, twist, crops, pin bones and many other points, the names of which he has not been accustomed to use heretofore.

The instructor next teaches the values of the different points and characters named and learned i nthe previous lesson. To do this most effectively he has a chart showing the different market cuts, or better still, he has a half carcass of the beef cut up before his class by an expert cutter; a steer as nearly ideal as possible in form and finish, and a skeleton. With this equipment he teaches the student the use of the score card from a utility standpoint alone.

The lion and rib supply the valuable cuts of porter-house,(T bone) sirloin and roasts. These must be thick and composed largely of muscle (red meat), with fat interspersed between the fibers, producing what is termed "marbling", these two cuts should constitute about 27 to 28 per cent of the total dressed carcass. The round is a good cut, as well, and its importance is emphasized. It is explained to the student that the head, neck, chuck (shoulder and fore ribs), brisket, plates navel, flank and shanks are cheap meat; but in order to produce the valuable cuts we must have a well-balanced, symmetrical steer, with strong constitutional vigor and large organs to enable him to make good economic use of the roughage and concentrates given him by the feeder. The butcher wants the thick, juicy loin, rib and round cuts, and the feeder wants an animal that will respond to good feed and care, and so we have the type, form the finish as outlined in the score card. The student sees the different cuts before him and is able himself to attach the values to the different parts of the animal.



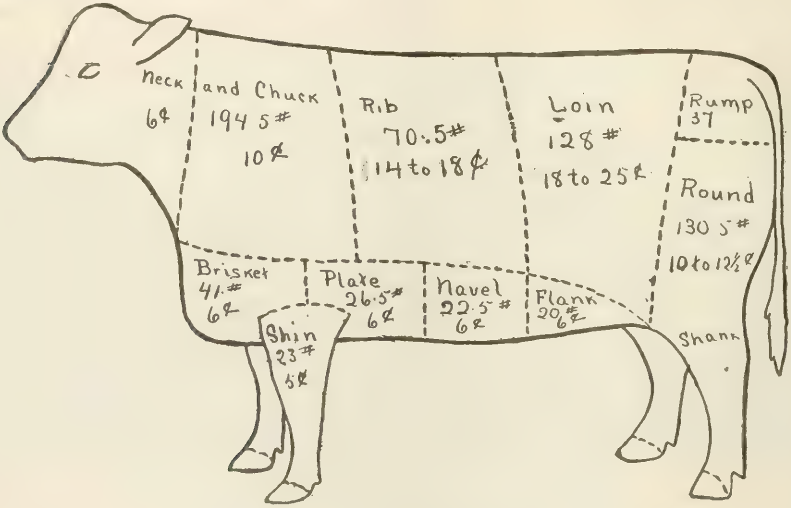
NUMBERED PARTS—NAME OF EACH APPEARS IN SCORE CARD BELOW

1. Weight. A twelve-months fat calf, weighing 900 to 1,000 pounds would be allowed 10 points. In case he weighed only 700 pounds, the student would cut him about 3 points and would place 3 in the column marked "student's score." A twenty-four-months fat steer should weigh 1,400 to 1,500 pounds, but one weighing from 1,300 to 1,400 pounds would be considered good.......... .... 10 points

2. Form. A straight top line is desired because slaughter tests have disclosed the fact that a droop in front of the loin usually means a thin loin, and a thin loin gives undesirable cuts. A full for-flank and low flank with not too much belly gives a straight underline. A full fore-flank means strong constitution. A low flank means a good doer, and is usually associated with a large percentage of natural flesh (muscle) ....10 points

Deep, broad, low-set steers are good doers—profitable to both feeder and butcher. The steer in the illustration would be cut 1 on top line, because of droop and rise, and 1½ on underline, because the high flank.

3. Quality. A fine, thick, furry coat of hair is associated with constitution and good doing qualities. Fine hair means a fine texture of flesh. A mellow, pliable skin is associated with a large percentage of natural flesh and good doing qualities. It is at this point that the student familiarizes himself with "handling" qualities. He should never stick the fingers into the sides and back of the animal. "Handle with a flat hand, so as to ascertain the touch with the forepart of the finger tips." By having good handling qualities pointed out to the bad, and to discriminate between them. With experience he is able to correlate handling with the appearance of the coat. A thick furry-looking coat is usuall associated with mellow handling, while a straight, stiff, wiry hair is associated with coarse,stiff handling, and this means coarse-grained flesh and a slow doer—an unprofitable steer ....10 points



WEIGHT AND VALUE OF CUTS.

4. Condition means the degree of fatness, as judged by the fullness at tongue root, covering the spine and rib; fullness of purse and flank..10 points

5. Muzzle broad, mouth large, indicates a good feeder. A wide jaw with strong muscling gives room for windpipe and gullet, and gives strength to masticate the food. Large nostrils indicate good breathing powers ....1 point

6. Eyes, large, clear and placid, means health, kindness, quietness and good doing powers..1 point

7. Face. A short face accompaines a short head, short neck and deep, wide, blocky body..1 point

8. Forehead broad and full, is an indication of braininess and good feeding qualities. A short, broad head usually has behind it a short, thick neck, and deep wide, low-set, blocky body..................1 point

9. Ears, medium size and fine, indicate quality and refinement 1 point

10. Horns, fine texture, oval, medium in size. These characters are an indication of refinement .... 1 point

11. Neck, short, thick and throat clean. A thick, short neck goes with a short, broad head, and low-down blocky body of the good feeding steer .... 1 point

12. Shoulder vein full. A full shoulder vein, with well covered shoulders and thick flank, is an indication of good mucling throughout the body of the steer and also goes with good constitution and good doing qualities .... 2 points

13. A shoulder covered with flesh, compact on top and smooth. An open shoulder is rough, while a narrow, wedge-shaped shoulder will not cover. The last conformation usually goes with a narrow body, and with a poor doing steer .... 2 points

14. Brisket advanced. The breast wide. A good wide breast, with a fairly prominent brisket is an indication of constitution and good feeding qualities in the steer. It adds also to his symmetry and balance ..1 point

15. Dewlap, the skin not too loose and drooping. Too much dewlap is a waste and oftentimes there is a collection of waste fat in this region .... 1 point

16. The legs are straight and short. This indicates strength and also a minimum of waste in the carcass. The bone should be fine and smooth. The arm strongly muscled. This indicates muscling throughout the steer .... 1 point

17. The chest full, deep and wide. The girth large and the crops full. The chest is the heart and lung cavity, and a good heart and good lungs are necessary in the good economic feeding steer. There should be no falling away behind the shoulders. The ribs should spring right out from the back and be packed with muscles .... 4 points

18. The ribs long, arched and thickly fleshed. This conformation will give a deep body, wide back and thick cuts of meat........8 points

19. The back, broad, straight, smooth and even. This conformation will give a large place on which to carry a large percentage of the high-priced roasts, porterhouse and sirloin steaks. Smoothness and evenness do away with bunches of fat, which would have to be cut away on the block and result in a loss to the butcher. .... 10 points

20. The loin, thick, and broad, because from this part is cut the high-priced porterhouse steaks .... 8 points

21. The flank full and even with underline. A thick flank indicates heavy muscling, and adds to the value of the loin cut, while its fullness at finishing time indicates a high degree of fatness .... 2 points

22. Hips. These bones are usually spoken of as the hooks, and while they should be wide apart in order to make a wide loin, they should not be prominent, but should be hidden away under thick muscles....2 points

23. The rump, long wide, even; that is, from the hooks to the pion bones should be filled with muscles, so that good, thick cuts of sirloin can be cut from this part. A high tail head is undesirable, because when the half carcass is hung up it leaves a large amount of bone in evidence, and detracts from the appearance of the side of beef. Patchiness means bunches of fat around the pin bones. This is undesirable. They should be smooth an even, as the bunches of fat would have to be cut off and sold at a very low price, and would be very wasteful to the butcher ....2 point

24. Pin bones, not prominent, but far apart. This gives width to the hind quarters .... 1 point

25. The thighs full, deep and wide. From these, thick cuts of round steak are cut, and hence the desire for heavy muscling in these parts .... 2 points

26. The twist, deep and plump. The twist is the junction of the thighs on the inside. The lower down the twist is carried, the larger percentage of thick, juicy cuts can be taken from the inside of the thighs, where the tenderest round cuts are made.....................2 points

27. The purse full, indicating fatness. As the steer fattens, the purse fills with fat, and this, with a full flank and a deposition of fat along the spine, is an indication of finish .... 2 points

28. The legs straight. Shank fine and smooth as explained above in 16 .... 2 points

The student does this work with the aid of the instructor. He fills the column denoted by "student's score" at the top and makes his cuts as his judgment would indicate to him. The instructor then goes over the same, and in the corrected score puts down what he thinks the amount should be cut under the different points named.

Two instructors might differ a little in the cuts that would be made, but the valuable part in connection with this work for he student is that he give the correct reasons for the cuts that he makes. At the same time, after the student has worked at the score card for two or three lessons and has had his score corrected every time by the same instructor, he and the instructor, are getting more uniformity in their work. The score card, at the same time is instrumental in helping the student to see things—not only to see things, but to see them systematically. For example, he looks at the steer from in front, from the side, and from the rear, and sizes up his animal, estimates the weight, and trains his eye to see the general form and outline of his steer. He decides upon the type; whether he is high or low set, whether he is of the deep, blocky type, so desirable in the beef animal intended for the block. He studies the animal from the head, back, and down to the legs and feet.

In this way the score card has been instrumental in introducing system into his work. When the student has familiarized himself with the different points, the valuations of each, and on the whole summed up what it takes ta make a correct type of beef animal, he is then ready to compare one animal with another. This is the work of the score card in assisting the student to form a correct estimate of his aimal, and hence correct judgment.

B---Regarding Hogs.

BREEDING AND FEEDING OF HOGS.

C. E. SMITH, CASS COUNTY, INDIANA, IN BREEDERS' GAZETTE.

No farming industry during the past few years has produced better results than the breeding and raising of hogs. The best breeds are those which feed best. While it may not be of any great importance to choose a particular breed, it is very desirable that special care be exercised in the selection of sows from which to breed. Endeavor to select sows of strength and activity; if they are strong they are better able to resist disease and endure the strain which naturally comes at the time of farrowing. If active they make the best feeders. If the bodies are short they will not produce the required amount of bacon. The size of the sow should also be considered. One less than 200 pounds weight is too small. I would prefer one of 300 pounds and not less than 12 months old at the time of breeding.

The boar should be not less than 18 months old, of 300 pounds with strainght back, and should be heavily shouldered and hammed. In other features he should be similar to the sow described. As it is physiologically true that animals sired by one past his meridian of strength are less active, more liable to disease and have less strength to overcome it, a boar of more than four and a half years is not desirable from which to breed.

Many say that the form of the head is of little or no consequence; that a good hog may have an ugly head, it being no affair of anybody but the animal himself, which has to carry it. Nevertheless the head is one of the principal points in which pure or impure breeding will be most obviously indicated. A highly bred animal will invariably be found to arrive more speedily at maturity, to take flesh earlier and with greater facility and altogether to turn out more profitably than one questionable or impure stock. This being the case, the head of the hog is by no means a point to be overlooked by the intending purchaser. The description of head most likely to promise, or rather to be the concomitant of high breeding, is one not carrying heavy bone not too flat on the forehead or possessing too elongated a snout; indeed the snout should on the other hand be short and the forehead rather convex, recurving upward. The ear, while pendulous, should also incline somewhat forward and at the same time should be light and thin.

Nor should the buyer pass over even the carriage of the hog. If this be dull, heavy and defective it would be safer to reject a boar on suspicion of ill health, if not of some concealed disorder actually existing or just about to break forth. Nor is color to be altogether lost sight of. In the case of hogs and in reference to any other description of live stock those colors are to be preferred which are characteristic of the most esteemed breeds.

One cannot be too careful in the selection of proper stock to breed from. If the desire is to get early into the market and to produce pork, the varieties most likely to take on flesh quickest and come earliest to maturity should be chosen. If on the other hand bacon is the object the larger breeds are most suitable. In any case the boar should be rather less in size than the sow and more compact and hard in the flesh.

With hogs as with cattle in-and-in-breeding is disapproved by most people as calculated to decrease the size of the progeny and weaken the constitution. Several instances could be mentioned of successful close breeding of this kind among cattle, but few among hogs, so that in the case of the latter at any rate, it should be and generally is studiously avoided. To secure a vigorous progeny, hogs should not be allowed to breed during the first year of their existence.

Feeding is a matter of first importance in making a success in the swine industry, whether one is engaged in breeding and improving the hog or merely producing market hogs for pork. The successful feeder must have a knowledge of his business much of which he obtains by practical experience. There are some feeders who have been feeding hogs from their boyhood days and have grown gray without having learned the science of feeding. The feeder who desires to make a sucess of the business should obtain a knowledge of the values of the different feds and the proper combinations of them for producing the best results. The farmer should study the tables prepared from the laboratories of the Government experiment stations.

It is not necessary that the feeder should be a scientific chemist to make a success of his business, but he should utilize the knowledge that comes from these analyses of the various feeds.

At one time it was supposed that shoveling corn over to the hogs or driving them into the field to hog it down was the proper method of hog feeding. It is now generally known that this is unbusinesslike, unscientific and wasteful, therefore unprofitable.

It is of prime importance that hogs should have an appetite and desire to eat; also that they should be healthy, as sick hogs are without appetite. In this condition they lose instead of gain flesh.

The feeder should keep a vigilant lookout for the condition of his hogs. It is much easier at the beginning of the loss of appetite or condition to bring them back than after lettering them get too far away from the right track.

The feeder who keeps his eyes wide open will at once see the first signs of hogs getting out of condition.

One of the most insidious foes to good health in hogs is constipation. It is the beginning point of a great many other serious ailments that affect hogs. It is easier to prevent disease than it is to cure it. It is safer to prevent than to be compelled to cure. By preventing disease the hog can gain continuously but after disease attacks the hog it loses and the profit in hog raising is lost with it.

It is not the feed which is eaten but it is that which is digested properly and assimilated by the animal that brings about good results. The hog that is clogged up soon becomes surfeited with feed and loses his appetite or desire for eating. To make a success of feeding, hogs must have appetites and anxiety to eat. Therefore it is vital that they be kept in condition for demanding feed. But do not over-feed; it is better that they should be a little underfed than over supplied with feed. Each ration given should always be eaten up clean, and the trough should be thoroughly cleansed after each meal. Never throw fresh feed into the trough if it contains any of the old or sour feed left in it. In this way you will keep the appetite toned up and a good appetite causes a good flow of saliva and naturally assists good digestion.

A voracious appetite which is natural accompanies indigestion, as the food does but little good. The hog remains hungry after he has filled up on all that he can eat.

The origin of the improvement in swine must have been from good feeding followed up by proper selection. Therefore feed has been largely instrumental in the improvement of the breeds of hogs as we find them today, as well as the origin and formation of the breeds.

The best breed and finest individuals by a system of poor feeding in a few generations can be forced back to the scrub. I repeat therefore that feeding is of prime importance in bringing success in the hog business.

A man must do some thinking for himself as well as reading the methods and plans of others. He must use his reasoning powers in adapting or adopting his own methods of feeding. He will be called upon to investigate the values of different feeds so that he can produce the largest amount of gain at the least cost in order to secure the greatest profits from the business. It will also be necessary for him to be able to make the best combinations of feeds on his farm, and at times he may be able to add to them profitably by the purchase of other addtional foods. These things will require careful thought, calculation and conclusions.

The gain of a hog comes from that which it eats, providing its digestive organs are in proper condition to transfer the feed through its chemical changes into flesh, so that there may be as little waste from the food eaten as possible. This can only be brought about by healthy hogs. If you start in with healthy hogs the skill and science of the feeder must do the rest. Its importance is therefore self-evident.

The good feeder takes pride in seeing the animals respond to his efforts as well as the benefits to his pocketbook. The hog gives the most generous returns for the feed consumed of all farm animals.

The man who feeds hogs has the satisfaction, if the feeding is properly done, of getting from one-third to one-half more pounds of gain from a bushel of corn than he can get out of either cattle or sheep, and these are the three great meat producing animals of the farm.

HOW TO PROFITABLY RAISE AND MARKET HOGS.

C. M. MCDOUGAL, BEFORE OSCEOLA COUNTY FARMERS' INSTITUTE.

Under present condition something beneficial might be said about raising hogs at a profit, but should feed stuffs advance and hog products decline in value, it would be a diffcult problem to work out.

First, it is necessary to secure good foundation stock from one of the distinct breeds. Occasionally we hear a farmer say he would rather have a cross from the different breeds, but I doubt that this will pay out in the long run.

It sounds as ridiculous to me to hear of breeders saving their smallest sows for breeding purposes, as it would for them to select the smallest ears of corn for seed. I have had the best success from matured stock; aged sows give more milk than young gilts.

Not long since I heard a man remark that his hogs were getting too much full blood. I think if more bone building material and less corn be fed to young growing hogs it would be much more satisfactory. Skimmed milk, oats, and good clover pasture with some corn added will bring good results. Shorts and a little oil meal are good. The best bunch of hogs I ever raised, and hogs that sold readily at the sale, were fed a small amount of cooked wheat as soon as the pigs were old enough to eat anything. I filled an old wash boiler partly full of water on the cook stove every alternate evening and when hot enough to boil turned in about one half bushel of wheat. After standing twelve hours the wheat was swelled to double its original size, or would make a bushel in bulk. I made two feeds of this for seventy-five pigs and fed it once daily. The little fellows would pick up every grain. I arranged side dishes where the old sows could not get to them. A little extra care at this time will help very materially in raising hogs at a profit. I break off the pigs tusks with a pair of small pinchers when they are but a few days old. This prevents them from getting sore jaws and heads by fighting while nursing. Bob tails are caused by the bedding getting damp; a little tallow applied in time and the bedding made dry will help to prevent the trouble.

Farmers who have fenced their farms hog tight claim good results. There is nothing better for young growing hogs and brood sows than to be compelled to travel to the farthermost corners of the field to get their feed. The exercise necessary promotes digestion, constitution and health. We shovel out too much corn to young pigs, as it is so convenient and easy. Have you ever stopped to note that the hogs raised, fed and finished for the premium contests in the large show rings never get more than two ears of corn per day? You will note also that these hogs are driven a mile or two daily for exercise.

After securing sufficient frame and constitution, I think the better plan for finishing for market is to bring the hogs in closer quarters; give plenty of thin swill, after which all the corn they will clean up twice daily. I never let swill or feed stand and get sour. Shelled corn should not be fed in troughs but thinly scattered over a smooth clean surface necessitating better mastication and less waste.

Much is being said about cement floors for pig pens. The cement being so nearly like stone, unless the owner is very painstaking and keep the pens well bedded, I fear the animal heat is not sufficient to draw the frost in severely cold weather. The hogs are liable to contract rheumatism and the joints become enlarged. As lumber advances in price more cement will be used.

Taking for granted that the hogs weigh between two hundred and twenty-five and three hundred pounds, which weights are most in demand, I will endeavor to say something about getting them on the market Farmers who finish out car load lots, which hequires from 15,000 to 17,000 pounds, find it quite satisfactory to ship their own hogs. Two or three neighbors who have hogs of equal quality can join in shipping, but where many small lots are turned together they fight and worry each other causing heavy shrinkage. The agent should know your desire for cars two or three days before time for loading. It is necessary to have the floor of the car level. A bushel of ear corn for each two thousand pounds of hogs, for a long haul, is sufficient feed in transit.

Cars may be bedded with a small amount of straw during cold weather but a wagon load of dirt or sand well sprinkled with water is better for very hot weather. During the extremely hot season train men are required to wet the hogs from hose attached to each water station on their line. Hogs shipped to nearby markets should not be allowed to drink at loading time, as it is stock yards rules to feed and water for a good fill before being weighed up to the buyer.

Care should be taken not to overload cars, as this causes greater loss than all else. The shrinkage on a car load to Chicago yards varies from one hundred to five hundred pounds, according to quality of hogs, time in transit and delay in reaching the scales. It is not absolutely necessary to acompany hogs to market, although there is some satisfaction in seeing the condition they are in as they are unloaded at the chutes. I remember one time while standing on the platform watching the unloading of whole trains, a young fellow who was trying to start a bunch of hogs toward the feeding pens, turned to me and inquired whether I had come in with the hogs. On assuring him I had not he proceeded to making cripples. The hogs had traveled a long distance and a few of them were sore and stiff in the joints but not crippled, and refusing to travel in a hurry-up manner would turn (as we say) head on the wrong end. The young man in charge would then jump on their hind quarters and break them down in order that they would be right there when the cart came around for them. I have since learned that cripples do not pass through the hands of the commission firm but are disposed of by this yard helper to one of the packers who makes a specialty of handling cripples. The helper reports the sale to the commission firm and receives a fee for his trouble. It is quite apparent that the temptations for making cripples are very great and the matter should be investigated.

APRIL PIGS FOR JUNE FARROW.

From BREEDERS' GAZETTE.

The writer has a neighbor who is something of a politician. Also he is a contractor engaged in various public works. At certain times and seasons he is best known as an implement dealer. Farther he is a farmer and a breeder of pedigreed swine. I recently spent an hour on his farm and I was greatly taken with a lost of some sixty odd spring pigs I saw. Not only were they large and well grown, but they were fat too. Apparently many of them were of March farrow. Imagine then my surprise when I learned that the oldest pigs were of May farrow; that some had come as late as July, and that the average birth date was the first week of June. Coming at this late date of sourse no pigs were lost from cold weather.

This is how he did it. Sows and pigs had the run of a small pasture. One side was blue grass, the other red clover . At morning and night the nursing sows were fed four ears of corn each. At noon they were given a mixture of ground barley, oats and middlings fed in the form of slop. As soon as the pigs were old enough to eat, they had a separate trough in which they were fed a thick creamy slop made with middlings and water, for along with Mr. Bonham the proprietor was very enthusiastic over middlings as pig feed. He believed it was fully equal to milk. While they were young the pigs were fed all of this they would eat and the slop was made thick. As the pigs grew larger the slop was made thinner. From the start the pigs were fed some corn, always a little, never much, because the proprietor believed a hog did not need much corn till it was old enough to fatten. They were also fed some oats, first old oats, later sheaf oats. But the main reliance was grass and middlings, together with the milk of the dams.

Considerable importance was attached to the fact that the pigs were slopped at the same hour every day. "For," said the proprietor., "every little rascal in the bunch carries an automatic self-winding, selfregulating time piece and he knows as well as any of us when his meal time rolls around. So every pig is always there and ready and never so full but what he has a place to put a fill of sweet slop." When the pigs become about eight or ten weeks old, pasture began to fail; then came for them one of the changes of life. Adjoining their pasture was a ten acre field of corn. Pumpkins had been liberally planted in the corn at planting time. The rich well manured soil made a heavy growth of both. When the time for the last plowing had come the entire field was seeded to rape. The only mistake was that the rape was sown too thickly and it grew almost like grass. Then one morning about the middle of August a hole was made in their pasture fence and the pigs were allowed the privilege of a ramble into the great beyond, of finding by experience how large a place the world is as far as the far side of the field where they came plump into another woven wire fence. This field was a great place for rambles, far explorations, for adventures and discoveries. Every morning before going to the field they were fed some slop, not all they could hold, but some, enough to balance the carbohydrates of the rape and corn and keep them growing as well as fattening. As they were no longer slopped at noon they naturally contracted the habit of staying in the corn field all day, and so it happened that almost before they knew it they were weaned.

To the writer one of the greatest surprises was to see how very little corn they had eaten. It was only the stalks that were down or leaning badly that were touched. They were eaten cleanly—ear, blades and all—not a particle was wasted. At night the pigs went back to their sleeping quarters where more slop and oats were given them. From October a few stalks of corn were broken down for them daily. It was in November when I saw them. Surely the average weight was 150 pounds at least. I was particularly impressed with the low cost of the ration fed. Only a limited, in fact a very limited amount of grain had been fed, but what little had been fed was exactly what was needed. The largest possible use had been made of grass and forage. One dollar's worth of feed had done more for this man than two dollars had done for many of his neighbors. As I left I saw a team on the mill grinding oats for the pigs. "I never grind oats for a young pig with sharp teeth," the proprietor said, "but when I see the oats coming through them unground then I start the mill. I think it is best for a pig a calf or a colt to grind his own oats as long as his teeth stay sharp so he can."

Many of our agricultural writers aver that rape will be smothered out or shaded too much by the corn to make any growth when sown broadcast in the cornfield at last cultivation, yet the writer has seen rape standing waist high in corn that would make 70 bushels per acre. Rape may perish in a cornfield, but it is not because it is shaded too much by the corn. In southern latitudes the young plants may be stunted by a lack of moisture. To the northern side of the Corn-belt where moisture is not usually lacking the young plants are usually smothered by the rank growth of foxtail and other grasses and weeds. When sown in the cornfield rape requires a fairly clean soil until the plants have begun to soar and spread, when they can be depended on to smother out any grass that grows, provided the soil is rich and strong.

CARE AND FEEDING OF HOGS.

C. E. Gaines, before Adair County Farmers' Institute.

To be a successful hog raiser and feeder requires years of experience and while the writer does not feel that he can do this subject justice, I will do the best I can.

I believe to be a sucessful hog raiser one should be particular with regard to the breeding stock; also we believe that many are too careless in the selection of their brood sows. Often we see men who have a bunch of young hogs, all being fed together and prepared for market, that when they are ready to select brood sows, will throw out a number of small and inferior sows giving the reason that they can get more for the large ones on the market and that the small ones are just as good for brood sows. This is a mistake, as it will pay the hog raiser to save the best sows he has every year, and we believe if he has no good ones it will pay him to buy some from his neighbor, or some one else who has them. Better keep less sows and keep good ones.

We believe that much harm is done to the hog raising industry by breeding immature stock, as the handling of young and immature breeding stock from year to year has a tendency to run them out, making them fine in the bone and with weak constitutions. There is a great difference of opinion among hog raisers, with regard to keeping old or young sows. Personally I believe it will pay any man to keep some old sows part of the time at least. and try and save your young sows for the next year from the old ones. We believe this is a step in the right direction to keep up a herd.

With regard to males, you should select the best that you can possibly afford. It never pays to keep a scrub. Do not be too slow in selecting your male as it will pay better every time to feed a hog a while and keep him in good shape and have him when you want him than it will to start out to hunt a male just when your are ready to use one, and then perhaps have to take an inferior one. Insist upon having the best, and don't buy a male unless he is a good one; don't be afraid of a few dollars if you are really getting a good animal; don't buy a male simply because his breeding is good, but insist on having a good individual, and if not a good individual better not buy him. We believe in buying pure bred stock, but we do not believe in buying a long tailed pedigree without any hog.

After having bought your male much, we think, depends upon his care and feeding, for the future good of your herd. He should have a good yard, if possible, where he can have plenty of room to exercise, and should be fed, not for the market, but just kept in good thrifty condition and not allowed to get too fat.

Another thing I would like to mention is, if you have a good class of hogs of some particular breed and are thinking of crossing with some other breed, don't do it. Select some breed you like and stick to it even though some one might try to persuade you to make a change. I recall a time a number of years ago, a friend of my father's, an old gentleman, visited us, and as he was a farmer and quite a stock man our talk naturally ran along those lines. He said to me "I have been crossing my hogs for the last year or two and I believe it is the thing to do. I am crossing back and forth between the Poland China and the Chester White," and he thought he got more pigs and stronger ones. So I thought if he could make money that way I could. I had a very good lot of Poland China sows so I bought a good Chester White male and thought I would try his scheme. My first crop of pigs were fine and I thought I had struck the right thing in the hog business. They were uniform in size and color (all white) and I swelled up like a toad and concluded I would show the neighbors how to raise hogs (and I did). I continued to cross back and forth between the Poland China and Chester Whites for three or four years, and at the end of that time I could show you most any kind of a colored or sized hog you wanted to see. So you see that my experience was that the longer you keep cross-breeding the less uniform your hogs will be. As far as the color was concerned that didn't amount to much, but when it came to having them all sizes, from nice, large, strong pigs down to the size of half grown rats, I concluded I could do better with one breed. So again we say select the breed you like and stick to it.

Another thing, we do not believe it is a good idea to get to thinking that some particular breed is proof against all kinds of disease, and that it is not necessary to take any precautions along that line. A number of years ago, when the red hog first came into my part of the country, a man saiid to me "Get re dhogs, they are always healthy, have lots of pigs and are never troubled with disease." But all the same, one of the worst experiences with hog diseases we even had in our herd was brought there by a hog covered with red hair. In our opinion it does not matter so much about the breed as it does their surroundings, and the way they are fed.

We believe, to make hogs profitable they should have plenty of range, good, clean sleeping places, and above all plenty of good pure water. Too many times our hogs are not as well supplied with water as they should be.

As to feeding, we people of the corn belt must depend principally on corn, but I believe a great many times it would pay to feed less corn and feed something else with it to balance up the ration. Corn has too much fat producing qualitiy and not enough bone and muscle making. The man who for winter breeding has plenty of skim milk and plenty of good clover pasture in summer we think the balanced ration problem is pretty well solved. But the man not so well situated will likely have to use something else.

I have often heard about how cheap they could grow hogs in some of the southern states simply by letting them eat acorns and what they could pick in the timber and finally finishing them by feeding a little corn, but judging from some I saw one winter in the mountains of northwest Arkansas I should think they never saw any corn, or acorns either.

We have had very good results from brood sows by feeding a ration of about one part oats and two parts corn, and I believe it is a good plan to add a little oil meal to the ration. I believe it will pay every time to feed your brood sows separate from the hogs you are feeding for market as the brood sow should not be too fat, but should be kept in a good, thrifty condition. Good, dry, comfortable quarters should be provided for the sows at farrowing time, and the pens should be so arranged that each sow can be shut off by herself for a few days at least.

Arrange to have the pigs all come as near together as possible as this will prevent the pigs robbing and will go a long way toward making a nice even bunch. As soon as the youngsters are old enough to eat they should have a place fixed for them where they can eat by themselves, and they should have about all they will eat up clean. We believe it pays to push a pig from the time he comes until he is ready for the market. We believe it profitable to push them from the time they come until they weigh from two hundred to two hundred and fifty pounds and then market them.

As to the time to have pigs come as you are aware, there is a great difference of opinion among hog raisers. As far as our own experience is concerned we believe that the early pig is the one to raise. March and April pigs have always given us the best returns where we had places warm enough to take care of them. We are aware that it is not very pleasant to prance around a hog shed all night with a basket and a jug of hot water to throw around the youngsters to keep them from freezing some of the cold nights we have that time in the year, but it has to be done sometimes where we raise early pigs. We believe if you want late pigs at all it will pay better to have them come in the early fall; let them get a good start for the winter, furnish them good quarters for cold weather, and then feed them out the next summer.

As to the feeding out and care of hogs to keep them free from disease we believe the best medicine is plenty of good pure water, clean, dry sleeping quarters and plenty of feed, and as to their diseases we believe that lice and worms kill about as many as any other one thing. We believe if a man will dip his hogs occasionally with some preparation that will kill lice, and feed them something to get rid of worms, that he will not have much trouble with hog disease. We do not mean to say by this that there is no other disease that kill hogs, but we do believe that a great many more hogs die from worms than is generally supposed.

I will say in conclusion that if the hog is given a fair chance and right treatment it will be hard to find any other animal on the farm that will give better returns.

WATER FOR HOGS.

BREEDERS' GAZETTE..

Some years ago an entirely unexpected circumstance threw into my care a number of pure-bred swine. They were a lot of outstanding good gilts. They were all about ten months of age, heavy with pig and of an average weight of nearly 300 pounds. It is needless to say that I was proud of my hogs, exceedingly so; in fact, my associates may have said disagreeably so. They came to me from the hands of their foreign-bred owner, one who was both ignorant and illiterate. Improvement was my plan. The hogs were good but I would make them better. The first improvement attempted was to reduce them a bit in condition, for they seemed too fat for successful farrowing. This was one of my first mistakes, but one of my least. For awhile an animal may be overfat for maternity. It is a great mistake to starve both mother and young in an attempt to reduce the condition just as parturition approaches.

To reduce the flesh the feed allowance was cut down almost to nothing. The run of a 40-acre field was allowed for exercise, but the results were disheartening. It really seemed as if those heavy pregnant sows could lay in their nests and fatten on sleep. Exercise they would not take. The alimentary canal long accustomed to a full ration did not at once contract and accustom itself properly to handle a half or quarter ration. Food instead of passing quickly through was retained until the measure was full. The consequence of starvation and constipation were sluggishness, a disinclination for exercise and at farrowing time dead pigs.

From litters of eight or ten an average of about four pigs was raised. Four pigs on a 300-pound sow in the hands of a professional feeder, one who could formulate ā balanced ration, who was alive to the value of oil meal, grass, packing house products and various other porcine matters, constituted a foundation on which were erected many an air castle. But I marketed those pigs when eight months of age, and the average weight was around 175 pounds. Clearly I did not know as much as the dutchman who did not know anything.

It was nearly a year later that I first met the original owner. To him I told my tale of woe. This was his receipt given in the King's English: "I tell you it is all in the water; yes, maybe some places hogs do not need so much water, but here ours do. We feed so much corn you know. You know corn heats them up so much they cannot grow. A hot hog cannot grow. I keep water where my hogs can get it all the time. Then I keep salt before them all the time to make them drink more water. But that is not half enough water. Then I take good nice middlings and I stir a little of it in a barrel of water. In winter I warm the water some so I can get them to drink lots of it. Then I like to feed them soaked feed or cooked feed; I do not care what it is just so it has lots of water soaked or cooked into it. I tell you if you want to see your hogs grow you just keep lots of water in them so they won't get too hot when you feed them lots of heating corn."

A physician friend of the writer's avers that is is true that civilized man will not drink enough water to properly dilute the digestive fluids. He adds that for the general ills of flesh the best and most effective cure is a few weeks at some watering place with instructions to drink all the water possible; that the system is bettered for years by the thorough flushing out and washing away of waste material it receives on such an occasion.

It has been commented on by many experimenters that animals fed heavily on corn will drink but little water. My old German acquaintance may have been a bit off about corn-fed hogs getting too hot, but nevertheless he taught me a short cut to results. The rusty, scaly, scabby appearance of stock watered once daily is more than a hint of what is wrong. The need is for more water and more soft feed, the result of which is sap and bloom, also better health, redder blood, more thrift and growth.

FEED FOR SOWS AFTER FARROWING.

BREEDERS' GAZETTE.

A. L. N., Earlham, Ia., writes: "Some sows are soon due to farrow. How shall I feed to keep them in good condition after they begin to suckle the pigs? Heretofore some of our sows after farrowing have lost their appetite. The sows are in good condition now and have each been fed six to eight ears of corn daily with not much slop. They were thin when bred but have gained well the past month."

Your inquirer is not feeding his sows as he should. Six to eight ears of corn daily with nothing else to sows carrying pigs is not a proper feed. If he wishes good results he should have fed from the time the sows were bred till farrowing and also afterwards a feed that would grow bone and frame for the unborn litter. We find there are several good feeds for this purpose. Either of the following would be good: Ground corn and oats, half each in measure, with 10 per cent of tankage added would bring strong litters; or this ration with wheat middlings added, and then with about 10 per cent of tankage he would have a good feed Either of these would be still better if with it could be fed some well cured clover or alfalfa to give bulk to the ration.

We have the past winter fed the first feed mentioned and the alfalfa chaffed by running through a power cutter, and mixing it with ground feed and all steamed a little, and our litters are coming large, strong and very active. The same feed should be given the sows after farrowing that the pigs may be free from scouring, as sudden change of feed just after farrowing is quite sure to cause this dreaded trouble.

Corn only fed to sows before farrowing will not bring good results, as sows thus fed to sows before farrowing will not but little vitality, and usually the sow thus fed wil be feverish and very apt to eat her pigs at time of farrowing. A. J. L.

HOGGING DOWN CORN.

BREEDERS' GAZETTE.

Answering the inquiry, "Will some one who has had experience tell us how long, approximately, it will take 40 hogs after they have been seasoned to new corn to hog six acres of corn that will make 50 bushels to the acre, and also state his objections to the method?" I would say that:

If one has a field of moderate size with water always available the corn can be hogged off to advantage. It saves labor and adds fertility. Hogs get plenty of exercise and are able to consume greater amounts of feed without dulling the appetite or deranging digestion than if fed in a small dry lot. They will also eat the soft cobs and greenish stalks, adding to their variety of food and to the bulk, which promotes good digestion.

For many years we hogged off part of our corn crop wherever we could with a portable fence cut off a few acres, where the hogs could get water. We never turned in, however, until the corn was out of milk, but lost no time after that. We prepared the hogs for this by cutting up corn and feeding it on the clover field, beginning to cut even when the corn was in milk. The hogs ate the ears entire and much of the juicy stalks. This feeding comes in well after the clover becomes woody and is not relished so much as the younger clover or green corn.

It pays well to keep a good supply of salt and ashes where the hogs can have ready access, as they will visit it as often as they will the water. After the hogs have eaten all the corn it pays to go over the field with a sharp disk to cut up the stalks and loosen the surface so the rains will penetrate the soil and not run off, losing the water and carrying off the fine lot of rich manure. The stalks are plowed under.

This hogging off is an easy way to save the labor of husking and feeding, and spreading the manure. The hogs do the work without cost. There needs to be care, however, not to keep hogs on the ground after a heavy rain. They injure the ground and waste corn at such a time. Fortunately we usually have no excessive rainfalls in late September and October.

How long six acres of such corn as your inquirer speaks of will last 40 hogs depends on the size and age of the hogs. Forty old sows would consume it in haalf the time required by so many spring pigs seven or eight months old. It is probable that if the weather was dry and there was little waste from tramping the corn into the mud the 40 spring pigs would have pleny of corn for four to six weeks. During the last two weeks they should have a daily feed brought to them to allow them some time to rest. If this field could be divided by portable fence so they would eat off an acre or so at a time they would do better. The changes to fresh feed would save the trouble of hauling in additional feed after corn would become scarce. It is well to let the brood sows or shoats glean after the fattening hogs have eaten off the bulk of the crop.

Why hogging off corn is not practiced so much as formrely in the older states we will not take space to say. In our own case it is because our portable fence wore out and lumber is too high and of too poor quality to pay us to make more, and a wire fence is hard to handle amoung heavy corn. In these days when the labor question is paramount hogging off corn appeals to the man with fields suited to it. L. N. B.

FARM BACON CURING.

DROVERS' JOURNAL.

With the increasings consumption of bacon in this country there is little question but what more hogs will continue to be turned toward this end. Already the demand in the cities of the country is considerable, and while the farmer as a class has not as yet made an effort to produce his own bacon there is little reason why he should not cure his side meat just as readily as he already prepares his annual supply of hams and shoulders.

On account of the packers' expensive and economical means of handling live stock, turning the various meat products to the best advantage, there is no opportunity for the farmer to do anything in the bacon line other than what he needs for his family use. For many years the farmer has supplied his own table, and even though it were clearly evident that he could sell his hogs on foot and replace them with the packer's meat at less cost, it is not altogether probably that many would follow the practice simply because the farmer naturally prefers his own product, even though he were fully aware that the other were equally good. This is simply a matter of homely custom that is as marked as it is doubtless impossible to eradicate.

FARMERS NEED MORE VARIETY.

It is with no attempt to flatter that we are frequently told that the farmer's cellar and storeroom is better supplied with the necessities of life than those of any other sort of people. This is true because the farmer produces his own, and out of the yearly supply takes enough unto himself to furnish his family to last until another harvest.

While the farmer's cellar and storehouse is proverbial for its supply, it frequently falls short when the matter of variety is concerned. Some time ago we pointed out the lack of the supply of fresh meats throughout the year, and suggested the means by which the deficiency might be overcome. In addition to this variety may be added. Bacon can be made one of the means for obtaining this end.

For generations the southern farmer has been noted for his bacon. With him it has been one of the staple products of the farm from the standpoint of home consumption. Doubtless the fact that the south has been a producer of the type of hog most resembling the bacon producer rather than the lard hogs has been largely accountable for his fact, while the corn belt farmer and his emmense supplies of corn and the subsequent fat porker has been inclined to ignore the luxury of home-made bacon.

NECESSARY COST IS SLIGHT.

In most cases the lack of home-made bacon is due largely to the fact that the farmer does not understand the means of making it. As a matter of fact the necessary extra cost over and above the preparation of other meats is not great. On most farms there is the smoke house that has been used for years in the final curving of the hams and shoulders. This same house can be used to an equally good advantage in the curving of the season's supply of bacon. Really, all of the necessary additional cost of curving becon over that of hams would be in the case of the purchase as a pickle pump, but this outlay is so small that the cost is little as compared with the possible comforts that might be derived from a well curved bacon supply.

In treatment some different plans must be made from what are usually followed in the case of curing smoked hams and shoulders. Bacon curing is an art of itself which admits of a degree of perfection that is probably not surpassed in the curving of any other class of meats. In Great Britain they have what is generally termed the "Wiltshire bacon. This system has been gradually developed until the bacon thus produced has attained quite an international popularity. From the fact that the quality of bacon produced is of high grade it is commended to those who are desirious of curing their own supply.

CURING BY WILTSHIRE METHODS.

The first step in preparing the sides for the pickling which obviously precedes the smoking, is to cut down the sides and neatly trim them for the pickling. Writing to the Farmer and Stock Breeder's Year Book for 1904 of Great Britain, Loudon M. Douglass gives some important suggestions that will be valuable to the man who is attempting to cure bacon. While Mr. Douglass' plan in its entirety demands that there should be a suitable slaughter house with the necessary appliance, including chillroom, storeroom and a lard house, there are, none the less, some hints that will be useful to the farmer who is without the means of supplying all of the useful through not necessary devices.

After cutting out the sides Mr. Douglass directs that the spare rib should be cut off and the blade bone drawn out. The next step is to apply the pumping pickle, which must be thoroughly injected into the meat.

The following are the ingredients and the proportion of each to the other in the pickle:

	Quantity.
Salt	5.5 pounds
Dry antiseptic	.5 pound
Fine saltpeter	.4 pound
Sal Prunella	.1 ounce
Cane sugar	5 ounces

Before applying, these various ingredients are thoroughly mixed with two gallons of pure water. It is expected that with pure materials the resulting liquid will be clear. If it is not, Mr. Douglass directs that the pickling be boiled and when the thick matter rises to the top it is to be skimmed off.

LAYING BY TO CURE.

Immediately after the sides have been put through the pickle they are to be laid on benches and covered with an antiseptic curing powder, where they are to be allowed to remain for some fourteen days. The antiseptic powder is made of equal portions of saltpeter and dry antiseptic. On top of the powder is laid a heavy coating of fine salt, when the process of curving immediately begins.

For sides weighing in the neighborhood of sixty pounds two weeks is regarded as about the right length of time to secure a mild cure. If a stronger cure is desired then a greater length of time is necessary. In any case, however, it is best to remove the first layer of salt at the end of two weeks and then recover again with fresh salt, and then allow it to remain in the process of curing until the desired strength is secured. It is generally supposed, however, that another seven days is all that is necessary to secure strength that is desirable for most tastes.

WASH BEFORE SMOKING.

When the sides are taken from the curving benches it is recommended that the meats be washed in cool, fresh water and after drying be placed in the smoke-house for three days' smoking. Mr. Douglass recommends this length of time at best for the finishing of good "Wiltshire bacon."

It will be apparent however, that there is difference in the matter of intensity of smoking, but in all probability no one will be able to secure too much smoke to overdo meat in that length of time.

There are doubtless other methods of curing bacon that will appeal to many more than this one may, though there is no questioning the superior quality of well done "Wiltshire bacon." Home-made bacon is not a new thing to hundreds of readers, doubtless, though the number is far smaller than it ought to be. More farmers will put up bacon if they can only be made to realize that the work is not extremely difficult.

C---Regarding Sheep.

SHALL I GO INTO SHEEP?

WALLACES' FARMER.

The high price of mutton and sheep is causing many farmers to ask themselves this question. For the last ten years we have been urging farmers in the corn and grass states to keep a few sheep. It is not worth while to bother with less than twenty-five head, and that number is enough for the new beginner. If he follows our suggestions these sheep will increase quite as rapidly as the ability of the ordinary farm to handle them. We need not go into details as to why we have urged this policy. Those who have adopted it have made good money, and by reason of experience acquired will make more money in the future, and more money than those who are going into it now. They have learned by experience, which is the only way in which a man can learn how to handle sheep.

Whether a man should go into sheep depends largely on himself and the character of his farm. In favor of going into it in this small way we might call their attention to the fact that the high prices for mutton and wool will probably continue for several years to come. There has been a great reduction in the number of sheep over almost the entire world. That is the reason why wool manufacturers and importers are even now in the field contracting for the clip of 1906. In the last four years the supply of sheep in the United States has fallen from 64,000,000 to something like 47,00,000, a reduction or nearly 25 per cent. An even greater reduction has taken place in Australia as a result of drouth. The sheep stock of European countries has likewise declined, but not in the same proportion. Therefore the man who goes into the sheep business has reasonable assurance of high prices for some time to come.

The question may arise: Shall I go into feeding or growing sheep? It will not do for the cattle feeder to assume that because he knows how to fatten cattle he is therefore an expert in fattening sheep. The business of fattening sheep, like the business of fattening cattle, must be learned by feeding them. The most careful man will pay considerable tuition, and hence it is entirely unwise for a man without experience to undertake it in a large way. The better way is to buy, if possible, some twenty-five ewes and a good buck of one of the mutton breeds, and get his education in this line at a minimum of expense. It would be difficult for him to lose anything if he knows how to take care of them, and he should be able at the end of the year to sell enough wool and lambs to give him back his money for his first investment, and particularly so if he has blue grass or other short pasture, and have his original flock intact.

It will not do for him to assume that pasture which is ideal for cattle will be ideal for sheep. The fact is that while cattle usually do well on such big grass as usually grows in the corn and grass states, sheep don't do well on that grass. In fact, the man who pastures his sheep on big grass a year like this will be very likely to get quite sick of the sheep business on account of the stomach worm.

Any man who thinks of going into sheep needs to heed the motto "Change of pasture is good for sheep." The man who forgets this will in all probability have trouble and be disgusted with the business. Why is change of pasture good for sheep? The great enemy of the sheep is not the wolf or the dog, nor even free trade, but internal parasites—tape worm, the worm which causes the nodular disease, but worst of all the round stomach worm. This last may be found in every flock of sheep, and particularly in the mutton breeds. If sheep are pastured more than one year on any one pasture, this pasture is likely to become infected; and if he uses this as sheep pasture from year to year it is quite certain that in years when grass has a rank growth on account of an unusual amount of moisture, that he will lose a large per cent of his lambs from this disease, and will spend a good deal of his time dosing them with gasoline and sweet milk or creosote and sweet milk, and will sometimes wonder which is the more expensive in the end, the remedy or the disease.

The worms, however, can be avoided largely by limiting his flock to one hundred or less on the quarter section farm, by fencing his farm sheep-tight, so that he can use the entire farm, by having his lambs come in February or March, and feeding oats as soon as they will eat them, which is when they are two or three weeks old, and oats and corn afterwards, then selling his lambs in June, and keeping his stock through on short pasture during the summer season. By "short" pasture we don't mean poor pasture, but short grass.

Handled in this way a small flock of sheep will pay 100 per cent a year very easily at present prices. By this we mean that if twenty-five sheep and a buck cost the owner a hundred and fifty dollars he can sell a hundred and fifty dollars' worth of wool and lambs in twelve months and have his original stock remaining. Whatever you do, don't let your flock increase faster than the capacity of your farm and your own ability to handle them properly.

SHEEP ON THE FARM.

W. J. BARCLAY, BEFORE MUSCATINE COUNTY FARMERS' INSTITUTE.

Six years ago last fall I concluded that I would go into the sheep business. I have several small lots and yards around the buildings that raise some grass, and also some weeds, that I thought sheep would mow cheaper than I could, and I find that I was not mistaken in this, as I have never had to mow them since.

From a financial standpoint I think that the sheep pay me a larger profit on the money invested, when the food consumed and the labor required in caring for them are taken into consideration, than any other stock that I raise on the farm.

At the present prices of wool and mutton, a good average ewe will shear about two dollars worth of wool and raise one or two lambs, that will bring about four dollars each, at from five to eight months of age.

I find that sheep, to do well, require plenty of range; not large pastures in particular, but they need to be changed from one pasture to another. It is also better for the farm to have every field fenced so that you can let the sheep run on it at some time during the season.

In the spring of the year I let my sheep have the run of the fields, where I expect to raise corn and oats, until the corn is coming up. I believe it is better for the oats to be pastured some as they are not apt to grow quite so large and lodge.

In grazing over the farm at this time of the year they will eat the grass along the fences and also a good many weeds that would cause trouble later in the season. I do not wish to be understood as saying that sheep will live on weeds altogether, but I do think that if given the chance that they will do more toward cleaning the weeds from a farm than any other stock. My sheep make me the least work during the year of any stock that I can raise. They are always on hand ready to be yarded at night. During lambing time, of course, they need the best of care and attention, especially during cold weather.

In conclusion I will say that I think that there are few farms but what would be better by having at least a few sheep raised on them.

THE RAM.

FROM THE AMERICAN SHEEP BREEDER.

There is an old saying, oft repeated and less heeded, that the ram is more than half the flock. And too often has it been noticed how little attention is paid to his selection. The wise shepherd or owner who is really breeding his sheep, and who takes ordinary pride in the quality of his flock, is already making his plans for the ram part of his sheep for the coming season.

Whether you may own only a small flock, or whether you count your sheep by the thousands, this subject of the ram is of equal importance. Here is the very foundation of your breeding, the real start of the lamb you expect to produce. For while like begets like, to a certain extent, yet there are certain characteristics which the sire impresses more strongly upon his produce than does the dam, and it is vitally important that these characteristics be the right ones, and that the sire be so bred as to assure the owner of a reasonable power of transmitting them.

Above all things, whatever breed you use, whatever the object in view in your breeding, use a pure-bred ram.

If you are breeding with a view of selling all your lambs at five to eight months old, and calculate to buy your ewes as you need them, you will find that you cannot afford to use anything but a pure-bred ram. Too many follow some such false reasoning as this: We are going to sell all our lambs. We don't care what kind of a ram we use; it don't matter whether we use a pure-bred or a scrub, it's all the same, and a grade we can buy so much cheaper. And this last is the real keynote of their whole argument, which is really as palpable a case of false economy, of a shining example of "penny wise and pound foolish," as can be found.

Did ever any man see as good produce from a scrub sire of any kind—sheep, cattle or anything else—as that from a pure-bred, other things being equal? If he has, it was so exceptional and so unheard of that it only furnished ample proof of the contrary. But to the question of dollars and cents—for that, after all, is to what all this is reduced in simple equation—and all reason and experience shows that the pure-bred is the most profitable and cheapest ram for the sheep-owner to use. He costs a few dollars more when you buy him, to be sure, but his lambs will be enough superior to those of the scrub or grade in general quality and uniformity, in weight and fleece, that the difference in the value of the lambs of the pure-bred and those of the scrub in favor of the former will actually more than pay the entire cost of the ram.

"Oh, yes, that's all right," says Mr. Scrub (for the sheep are generally a reflection of their owner), "but my sheep bring just as much as the other fellow's." Is that so? Perhaps; but we have noticed that the top sales, that the winners at the fat-stock shows, whether individuals or car lots, were all invariably bred from pure-bred rams. Again, the largest and most successful sheep raisers on the range and the farm use pure-bred rams, and their sheep top the market as sure as they ship. If such extensive and experienced raisers find pure-bred rams the most profitable, how can any sheep owner afford to use anything but a pure-bred ram?

And how much more important is it for the raiser who plans to breed his own ewes, and thus maintain his flock with the increase! The increased value of the ewe lambs alone from a pure-bred ram over that of common, scrub ewe lambs will pay the entire cost of the pure-bred rams, say nothing of other considerations. A pound of wool or five pounds of mutton more that you secure on every pure-bred lamb than you would from the scrub helps pay for that good ram, and adds value to the entire flock.

Whatever breed you use, whatever aim you have in mind in your breeding, whether you want a medium wool, a long wool, or a Merino, the breed does not matter; but whatever it may be, have it pure. No scrub, no cross-bred grade with a mixture of every kind of blood should be allowed. Breed straight and improve your flock and fatten your pocketbook.

Now, then, if your intentions are right and you will insist on a pure-bred ram, get as good as you can. By this we do not mean for you to get a prize winner nor a car load of them, but get as good as you can at a reasonable price—rams that show good breeding and are serviceable and bred to produce good results. If you know anything at all about sheep, you have some idea what in general constitutes a good ram. Some things worthy of notice are a good, strong masculine head, a strong bone in the fore leg, a wide chest and good heart girth, a well-sprung rib, and a good square hind end. Pointed, sloping rumps and cat hams should be guarded against as much as possible, as well as narrow chests and pointed shoulders. If you need a lot of rams, have them as uniform as possible, for evenness in a bunch of rams or a flock of sheep adds considerable to their value.

Do not be afraid of buying too good rams. Money invested in good rams will bring in bigger returns on the investment than in any other branch of the business. It is a fact that good rams sell for less money in the United States than in any counrty that raises sheep. Every year we see numbers of our best sheep go to other countries and sell at figures that look crazy to most sheep owners here. And yet those same countries continue to buy good sheep year after year, and to improve their flocks and add to their own fortunes.

But even if good rams do sell cheap here, yet the average owner has wanted to buy still cheaper, until the level of prices on good rams has become so low that they cannot be produced at a profit, because so many owners, rather than pay a fair price for a good ram, buy a scrub because his first cost is a dollar or two less. They seem only to think that they are buying so many pounds of mutton, instead of looking ahead and remembering that it is what that ram will produce that determines his value. They are really buying his lambs; but too many cannot see that far along.

And this short-sighted policy of using any old kind of a ram that would get a lamb has been followed altogether too much and too long. The present condition of the sheep industry in this country should forbid any owner longer following this policy, and its future development certainly requires more care in the selection of rams. In these times of prosperity is the time to start the right way, if you have not already done so. Then buy good, pure-bred rams. “Wanderer.”

ANCIENT SHEPHERD'S CHAPTER.

From The American Sheep Breeder.

WINTER QUARTERS.

Very much of the prosperity of the flock during the coming year will depend on the manner in which the sheep go through the winter. The safety of any animal depends, not only on the food it receives, but on some other conditions by which the general health is affected. Food is the raw material only, of which animals are made, as may be said; and the general economical use of food depends on what we may call the mechanical operation of the machinery which does the work of supporting life, and contributing to the growth.

Food is consumed in very much larger part in the production of the heat in any animal; and this heat controls the condition of the blood so as to make the circulation of it duly effective in supplying all the demands of the vital functions of the system. After these are duly supported, and then only, the surplus matter of the foods is changed into animal substance, which makes the increase of the young and growing body, and the residue is ejected as waste. It is very easily perceived, that kind or condition of the foods, and that, as well as of the animal itself as to its vital functions are of the most vital importance in the management of a flock, and considering the exigencies of the season, the attention of the shepherd must, for the good of his sheep, be very closely engaged in providing all the needed conditions for comfort, as well as mere food. Thus it has been roughly said that a good tight shed is the best kind of provender the flock can be supplied with. It is true that the food, when, and so far as, it is digested goes to furnish warmth, first of all to the animal; and then only is the growth increased so that a flock may very easily be carried through the winter and come ont in the spring merely alive and in about precisely the same condition as that in which it went into the winter quarters. The truth is that many a flock does no better than this, and that in such cases not an ounce of increase in weight of body or fleece has been added for all the winter's feeding. Such sheep are those which it has been said are of that kind that the owner has said of them that he never sees them but "he wants to kick them all over the yard." But the innocent sheep are not to blame for this not uncommon condition. Only the careless owner is, and we will not call him a shepherd because this word is held to be only another for some kind, considerate man who loves his gentle flock and does a good deal of thinking for, and of them, in the quiet hours of the night when many a good man makes mental notes of what has been missed during the work of the past day, and lays plans for better work in the future. And there is much work due to the care of a flock that will be thought over by every good shepherd in this way, especially in the winter. In fact, the good shepherd will ever find that the winter is really the most important part of the year to him, for it is the seed time of his mind, so to say, in which the plans for the next season are cultivated and ripened for use, to the saving of time, and the very best application of thought and experience for the use in the future. In fact, no one who lives as he should can do his work, of whatever kind it may be, without much thoughtful study of the conditions of it, and timely preparations for this doing of it in good season and the best manner.

CLEAN SHEDS.

There is an ancient story to the effect that a two-legged puppy once asked a wise man what was the best kind of scent a gentleman should carry about his person to make himself agreeable. He was told that "a gentleman should have no scent about his person, at any time, or under any circumstances." Now we may sometimes apply some things to other circumstances, and so with this, apply it to the general care of a flock in the winter, as to the sheds and feed pens for the sheep. It is only a dirty sheep that can be detected by the strong odor from its filthy fleece. The well kept sheep need have no smell at all, even in its fleece, and the winter pens, properly littered, may be as free from disagreeable odor as the shepherd's kitchen may be. The sheep is a clean animal, and will not willingly lie down on filth. It may even be possible to keep sheep in a pen all the time and keep them quite clean and yet never clear it out all winter. This is truly so, for it has been the custom with the writer, and the pet ewe has even had the entrance at times into the kitchen, and has had its cake given by the hand of the mistress, and departed without leaving a trace of disagreeable odor. The pen must be kept quite dry, plenty of fresh short litter, forest leaves—the natural bedding of sheep— make the best kind for the pen, and there will be no need to clear the pen if plenty of fresh leaves are added often enough any time during the whole winter.

CLEAN FEET.

The weakest part of a sheep is its foot. Speaking, we think quite reasonably, this was not made for a domesticated sheep, but it is the best possible foot for an animal which made its home on the inaccessible rocks in mountain countries, where it was first established. We have civilized the sheep, and now must take the best possible care of its feet or it will not be able to do its best for us.

If we study the sheep's foot we find it admirably made for the use of a mountain climber, which it is naturally. The foot is cupped, and the edges are sharp when the foot is naturally kept, for the sides of the hoof are worn off as they reach the sole and the sharp edged cupped hoof can walk on the most slippery places, and climb steeply sloping rocks, taking firm foothold wherever it may leap.

Now we take this mountain climber, and keep it in a damp soft meadow. Or we may confine it in a shed, having a floor sodden with urine and soft dung. What a contrast with the natural conditions! How can we expect such a foot to keep its natural condition under these unnatural provisions? Then we must come to the relief of the sheep and change its nature to conform with its changed circumstances. It is easily done, but it must be done as it is required.

The growth of the foot, being downward, the overgrowth must turn under the foot, for the horn will naturally follow the line of its growth. Then there is formed at once a receptable for all sorts of rubbish and soft stuff, especially the manure of a shed, in which the sheep are confined. This stuff is the worst possible for the place. It is soft and soon ferments, thus softening the sole of the foot and the turned under horn of the sides, and inevitable lameness follows in a few days. The careless shepherd, or one not knowing the condition of the feet above described, sees nothing wrong, and so these conditions become worse day by day, until the sheep goes about on its knees, praying for help from its keeper.

It is useless to talk of treatment for a cure. The condition is to be prevented by the simple remedy of clipping the growth horn on the sides of the feet with a pair of shears or scissors, or a sharp knife, and by destroying the unnatural conditions, restoring the natural ones. All that is to be done is so simple that no directions are needed. Prevention, as in all other cases, is the very best cure.

THE WATER SUPPLY.

An owner of a flock was once heard to boast that his sheep never had a drop of water the whole winter, and did very well by eating snow. Doubtless it might be true, for a sheep is a long-suffering animal, and will worry through a good deal of neglect and ill usage. This is due to its natural hardiness; for by nature it was a mountain animal, as is its relative, the present existing Rocky Mountain wild sheep. Thus some flocks, kept on farms, to-day manage to pull through a good deal of hardship and neglect, and it is an easy matter to find flocks which have lived a through all winter, several of them in fact, without any water at all in a liquid form, eating snow to quench their thirst. This, however, will be hard on the pregnant ewes, whose as yet unborn lambs very visibly kick against this kind of coolness on the part of their dams, and neglect on the part of their owners.

Sheep should be watered twice a day through the winter, once in the morning after eating, and again in the afternoon, and the water should be drawn fresh from a well. The-troughs should always be turned over to empty, and be left so for the night, so that they will never get filled with snow. They are best made V-shaped, so that the last drop of water may be soooped up by the sheep, and when turned over in the evening will never be filled with snow. Sheep do not like to put their noses in ice cold water, and thus a flat shallow trough a foot wide, raised two feet by spreading legs will make the best shape for use, and for the comfort and convenience of the flock. And the water for them should always be given freshly pumped.

FEED RACKS.

Feed racks may be made so as to be a nuisance and worry to both the sheep and the shepherd, or they may be so made as to be convenient and economical. The bars should be no more than three inches apart, and should slope inward, but only sufficient to make the dust and fragments fall inside the feed box. The sheep should not be permitted to push their heads inside the racks, for this tears the wool from the necks, and makes strangling probable by a sheep becoming fastened between the bars. The bars should be rounded on the edges, and so made as not to tear the wool from the sheep's necks, if they do get the heads through. They should be made on the floor, so that there may be no space under for lambs to crawl in and get fast. The best material for them is pine or poplar wood, as these do not make sharp splinters, and they should be well smoothed to a finish.

WINTER LAMBS.

There is no question of the profit of the winter lambs. Nor does the unusual season add anything to the cost of them. In fact the cost is less than that of the latter spring lamb. Being at home and under close observation the risk of accident is lessened and more lambs may be reared easier than the later dropped ones. The earlier breeding of the ewes too is gradually hastened, and in a short time the lambs may all be dropped before the end of the year, and if desired there may be a second crop reared within the twelve months. The extra profit of this is beyond question. The late summer lamb may be made salable for the Christmas market and a high price secured for it, and the spring lamb will come in for the Easter festival. But there is a choice of the breed of ewes to be kept for this use. The popular taste is for black faced lambs and it is certainly justified by the facts. For the lamb of a Shropshire ewe with its black face is of better value in the market than any other for the reason that these marks have long been associated with the fat, plump body and the tender meat. And while the popular turkey still holds the popular fashion for the day, the lamb is a representative for the season and his is a continuous one through the whole period.

Why the twice-a-year lambs should be popular is something that goes without any thought of question. Good things are ever welcome and desirable and the number of purchasers that now crowd of markets for them make the production of rearing of them very desirable to the farmers of the vicinity of the large cities. All the more so that the trouble due to them comes in a season of leisure when there is nothing else occupying the attention of the farmers who live near the large cities. Such locations are not yet appreciated for their extra value for these and other related products. In a smaller country and more crowded population these special products occupy the attention of consumers much more extensively than in our more thinly occupied localities, but there is no reason why this should be so if the producers would take the due care to inform those interested of the facts in the case. To let the world generally know what one has for sale is the emphatic business of all producers and if this were done there are thousands of opportunities of making good business where at the present none is done. Farmers do not as a rule try to learn of what kind of farm products people are desirous and take no means of informing the public what they have for sale. Why should not farmers, who are the largest producers in the world, let the public know of what they have to sell? Farmers now are not limited to hay, corn or wheat as the staple salable products. There are a score or more of very desirable products that are very convenient and would be very profitable for farmers to make and sell that the general public don't know anything about, and never seeing are never desiring. Most of us don't know what we want until we happen to see it and immediately we find it we want it very badly. And it is foods and a larger variety of them that the people are hankering for if they could only realize the fact by seeing them. And the writer's experience in this line, for he was the first to offer fat young lambs for sale in the market of New York City at Easter, and later for Christmas, and a shipment of ten at once was the limit of possible sale. Now thousands of them hang in the stalls and find rapid sale at good prices. It is true that only a limited class of purchasers are found for these at the present high prices, but the business is growing and very rapidly spreading to the smaller cities, so that the supply is not in any danger of being overstocked. Indeed, in all but the largest cities, there has been so far no supply offered, and as a variety from the Thanksgiving turkey there is no opportunity given for the country people so far as even trying what a luscious fat sucking lamb is and of tasting its special savory qualities.

But there is a great opening for this business. And it is the most profitable one to the producer who may get very easily the price of two full grown sheep for one twenty-pound lamb live weight. Fresh grapes are now selling for a dollar a pound and at this price the grower makes twenty times as much profit as from the summer fruit. The finest kinds of butter bring a dollar a pound and this even in the summer time. The class of purchasers who can afford to buy things at such prices are increasing in number continually and as there is no greater luxury put on the wealthy man's table than a fat young sucking lamb, and the supply is very inadequate, so the price to be obtained is proportionately high and profitable. There have been quite recently several lamb farms established in the vicinity of Chicago, where fat stock for the Christmas festivals and the New Year is especially reared, and there is room for many more.

BREEDING SPRING LAMBS.

There is still a lingering idea that a lamb is too young an animal to put to breeding. There was a belief, some time ago, that a three-yeal-old ewe was the right animal to put with the ram, which should be five years old before it could be safely bred. It was said in ancient times, that far in the future a thousand years should be as one day, and one day as a thousand years. Camparatively as this is to be understood this time has come, for in the fact the prophecy has been fulfilled. For it comes to the same thing that we may communicate with another person twenty thousand miles away in a moment, and travel more than a mile a minute. In this age we are pushing things, and if a colt is fit for the race course at a year old, and the greater part of the world's business is done by youths under twenty years old, we may very reasonably push things equally in all matters. Thus in conformity with the modern methods, otherwise, we may very properly and safely breed the last year's lambs and so largely increase the product of our flocks; a full half anyhow.

The matter has been settled, however, and has passed the stage of discussion. At a year old lambs are now sheep. There are plenty of cows under two years old, and market beeves no older. Any full grown man may now remember when a steer was fed five years before it was thought fit for the butcher, but the farmer who should feed any animal in this way now would quickly find his only refuge in the poor house, or deservedly go to an asylum.

There is no good reason why last spring lambs may not be bred now. It will increase the stock of sheep, which in fact needs replenishing, if it is true that we are five sheep short out of every hundred we had two years ago. But like the growth in substance, as compared with age, we may very reasonably breed with age, we may very reasonably breed the lambs of last year, and so practically almost double the breeding stock at once. The rest is a mere matter of feeding.

This is only consistent with the present order of all things. It is one of the fundamental principles of our present economy. We cannot afford to give two year's feeding to a lamb, and then wait another year before it comes into profit. The farmer or feeder of live stock, in fact any business man of whatever kind he might be, will be in a poor house in a few years if he should follow the methods of his father and do things as he did. And it is so with the shepherds.

But things are as we make them. A few years ago we did not recognize at all what was meant when we read that the Creator gave the world to mankind to possess it, and do as he wished to with it. This we are only now learning; and the probability now is, that it is but a matter of time until everything we may wish to do with this world we shall be able to do in time, after a few trials and attempts. And this we feel proper to say to our good friends who wants to know what we think about breeding last spring's lambs.

Of course circumstances alter cases. We would not breed lambs which have not been properly fed and are under grown; that is, that have not been on the best of pasture since they were weaned and were fed from the day they could eat a little ration of meal and bran, and before that were fed by a ewe whose food all the time was good pasture and a regular ration of mixed meal and bran. We make sheep by feeding. They do not grow on nothing. It used to be the manner to think and act as to them as if they did this. But we know better now, and we all think that lambs will be as we make them, and the way to make them is by feeding, and if they don't know as yet how this is done, we train them in the way they should go for a few days, after they are a week old, and then keep them in that way. And lambs learn very quickly even when only a week old. The whole world is going on this basis now, and although we may see very amazing improvements in the past few years, these will be nothing to what is to come before many more years. Then let us now be in the front, and ready to march with the foremost, and those who are ready in the best manner will take the lead with all its advantages. There have been amazing improvements in horses, cattle and all other possessions and works of mankind, and why should not the shepherd come in at the head, as he may if he will? So let us begin now. Feed the spring lambs in such a way as will mature them for breeding, and let them run with a rather light-weight ram for the present. Then notice the result, and let us know what it has been for the encouragement of those who doubt.

VALUES OF FOODS.

Many farmers in the middle and eastern states find good profit, iin a very convenient way, by feeding lambs purchased in the markets as unfinished material, so to speak, and by feeding them finish them ready for sale; thus making a good profit not only on the original value of the lambs, but as well on the cost of the food consumed which of course is mostly home grown; and in addition they get a very satisfactory return in the manure, and the home market made for the disposal of inferior and unsalable stuff. It is no new business, at least on the other side of the ocean, but it is on this side, for it is really the result of useful lessons learned from English farmers who have carried on this business for many years back as one of the most profitable ways of adding to the fertility of their land, gained by the use of foods consumed, and turned into manure, as well as one of the most salable products of their enterprise and surplus capital. This word surplus of course used in a comparative sense, meaning outside of the ordinary business of the farm, and a side line—as said by mercantile people— but a very profitable and easy addition to the ordinary routine of the farm work. It has long been one of the maxims of the science of agriculture, that the feeding of cattle is the most profitable part of the work of a farm, and we are only now taking up this part of the farm business as one of the "time-honored" parts of the English farm work. Then if our English competitors can import our surplus stock and our feed (corn, oil-meals and even hay) and so make very good profit, why cannot the same thing be done by our own farmers in the East; and the Western lambs be bought in the markets and fed on the surplus produce of Eastern farms, and the roughness which otherwise would be wasted for want of a use for it—and the finished lambs then sold in the local markets to the butchers; and in this way good profits be made?

This question needs no answer; it answers itself. And this being so it should be taken up by farmers in the middle and eastern states, and made a common practice, to the very great profit of all who will heed the lesson. It is no new matter. It has been a common practice in ancient times but has survived through its own vitality and absolute necessity in the practice of agriculture. And hence the common adage above quoted.

The greatest advantage of it is, that the otherwise waste products of a farm may be turned to very great profit. These products may be of home growth or may be purchased in the markets. An instructive example may be given from foreign sources, where sheep are even purchased and carried three thousand miles, and more, and the feeds as well are procured in a similar way. The farmers of Great Britain, Germany, and other European countries, carry on this business quite largely, and very profitably. Here we have the sheep and the foods all at our gates, at a much less cost than to our competitors, and the transportation to the European markets costs no more for us than for them. Why do not our farmers do this business themselves, and not only make the profit of the feeding, but the saving in the cheaper transportation from this side to Europe, and what is worth considering, the manure made as well? We certainly need the money to be so made, and it will go far to increase the values of our lands, worth now only a fourth or less than the farms in Europe. We need, too, the manure made in this way to increase the products of our farms to an equivalent with the more productive fields across the ocean. We need our sheep, too, on the most important principle of industrial economy, to the effect that finished products only should be sold from the farms, so that these profits so made may inure to our own lands and farmers. Thus we preserve the natural fertility of our lands, instead of selling it abroad in the form of raw products, as the corn and other feeding stuffs, all of the exports of which, fed abroad, becomes an equivalent of the selling the natural fertiity of our farms; which, in this way, is sent abroad to enrich foreign fields at the expense of our own.

We see, thinking over this matter from these practical and scientific points of view, that we are throwing away great opportunities of enriching our lands, and people, by putting our own native sources of agricultural wealth into the hands and pockets of our competitors, when the most clearly apparent facts go to prove conclusively that we may turn all of them to our own benefit and advantage, by using our own common sense in the matter. It is a clear and simple proposition for us to consider, and turn to our own advantage. Some may say, "let the farmers rear their own sheep then and thus get the fat from both sides of the opportunities." This very plausible proposition may be disposed of in the mere statement that it is opposed to the science of business. This is to the effect that all raw products should be completely finished at home, and in this way labor is aided at home, and the profits are kept in our own pockets.

PROFESSOR PLUMB ON THE SHEEP SITUATION.

In American Sheep Breeder.

In an address before the New York State Breeders' Association Prof. Plumb made the following terse remarks on the sheep situation:

"Sheep business should be considered from a business end. Sheep are money makers when properly handled. For some reason that is difficult to understand the sheep industry in the United States has declined relatively in alarming proportions. There has been in the last thirty-five years a great falling off in the number of sheep when considered in the ratio formerly maintained as to population. In the early history of this country sheep were very important. They were scattered all over the New England hills and gradually extended in other directions. But while the population has materially increased the number of sheep kept has not increased very much, so that in thirty years while the sheep population remains about the same, the human population has more than doubled. In 1870 there was one sheep to every man, woman and child in this country. In 1900 there was only about half a sheep to each of the human population. There has been a decrease in the number of sheep in other countries.

There is a notable decrease in sheep all over the world. Great Britain has met with a steady decline during the past five years. The same may be said of New Zealand, Germany and other countries. Australia has only a fraction of the number of sheep raised there five years ago. This is more directly owing to the result of the unprecedented drouth, but it adds to the general story of sheep depreciation. The only country that shows an increase is Argentina and this is owing principally to the frozen export meat trade that they have been industriously building up. The most enlightened and best civilized countries in the world are the countries which consume the largest proportion of domestic meats. Meat consumers are increasing, but the production of sheep again shows a decline when compared with the meat consuming nations and taken in connection with the population. For instance, the population of meat-eating European countries has increased in the last decade about 35 per cent, while the number of sheep has increased only 20 per cent.

All this goes to show the possible profits of sheep raising in the near future. There is probably more money made in feeding sheep in proportion to the money invested than in any other farm stock. That is, the profit from sheep is greater on each dollar invested than can be realized in any other stock farming operation. Actual reliable records show a per cent of profit that is akin to the "get rich quick" schemes that are occasionally exposed in the daily papers. By actual experience one lot of feeders made a profit of $1.18 per head, or about 42 per cent on the money invested. This was clear profit. I might say here that in direct profit corn and oats probably are the best feeds. As corn and oats fed together combine to produce the greatest gain in weight, and this of course leads to the end desired. By a series of actual experiments it has been demonstrated that one acre of rape will sustain twelve lambs two months.

Jacob Zeiglar, who grows sheep on high priced land, says that his lambs and wool pay for the sheep, so that the money received for the sheep is clear profit. He reckons that the manure pays for the labor. Twenty-four scrub sheep were bought at $4.20 each, which, after being pastured and fed on corn and oats, were sold for $8.69 each. Feeding sheep on wheat land for five years in succession will double the yield of wheat.

In another instance fifty-four grade ewes, costing $167, droppel sixty-one lambs and the original ewes sold for $654, showing that money can be easily made on high grade ewes when properly handled. There is more money in thoroughbreds, but grades are good. There is, of course, much more profit in breeding or feeding the best quality. The best money always is made by full feeding, but many men try to get along on the minimum amount of feed. It is a mistake. Good sheep pay the best. After the right quality is obtained, then liberal feeding of the right sort does the finishing.

In sheep raising dogs are the greatest nuisance. There are more mongrel dogs in America than in any other part of the world. It is a peculiar thing that American farmers either can not or will not, or they are too indifferent to grapple with this subject and find a satisfactory solution. The American farmers may be trusted to adjust all matters affecting his interest except that of cur dog, and this has proved too many for him. If mongrel dogs were killed the sheep business would be much more attractive and interesting than it is. In my travels in Europe I have noticed a great many sheep of different countries and in different sections of England. I have visited some wild, desolate looking places where the houses were very poor, few and far between, but the country was overrun with sheep. I saw sheep everywhere, and I failed to find any damage inflicted by dogs. At the same time they keep dogs and numbers of dogs, but they are thoroughbreds and apparently intelligent enough to know that sheep should not be killed. It is my experience that thoroughbred dogs do not, as a rule, kill sheep."

CONSERVATISM IN SHEEP FEEDING.

BY HON. PETER JANSEN, BEFORE SOUTH DAKOTA SHEEP BREEDERS.

"I have entitled my paper 'Conservatism in Sheep Feeding" believing as I do that at this time of high prices for sheep and wool we should carry on the business on conservative lines. I need not tell you that I am one of your adopted fellow citizens, although I claim to be as loyal an American as those of you who were born under the Stars and Stripes. Landing in Nebraska in the year of 1874 I went to raising sheep for the wool on the then open prairie. Conditions soon confined to our own land, and settled up very rapidly and we were soon confined to our own land, and we had to change our operations to the raising of corn and hay for feed, and to depend on the sheep breeders of the Western states and territories to raise and furnish us the feeders.

"In those days we had no college professors and experiment stations to find out for us and tell us how things on the farm should be done, how sheep and cattle should be fed and what constituttes a so-called 'balanced ration' for animals. However we soon found out that two-thirds of shelled corn with one-third oats, by measure, and a little bran or oil meal added as an appetizer and plenty of good bright prairie hay would make very fat sheep in about four months' careful feeding. We had only the Chicago market those days, and that was limited. Well do I remember the time when a run of 6,000 head of sheep in the Chicago yards would swamp the market.

"I shall dwell upon the subject of markets later on and will only say here that since then the American people have learned not only to cook mutton, but also to appreciate this, the cleanest and most healthful of all flesh food.

"Your state, as I understand it, is just starting in the business of feeding sheep and lambs, and as your climatic and crop conditions are very similar to those of Nebraska, I see no reason why you should not succeed equally well, provided you exercise conservatism.

"The American people have one great characteristic. If a certain business has paid well for a year or two they rush in and soon cause an over-supply of the commodity. To the new beginner I would say try a few car loads, and if you find yourself adapted to the business, if you like sheep and sheep like you, stick to it, even if the first venture should not be so very profitable. To the old feeder I have no advice to offer, as he probably knows more about it than I do myself, but I have seen old feeders who fed several hundred head very successfully fail when they multiplied the number by ten or twenty.

"The first essential in feeding sheep, of course, is a never failing supply of good, clear water. We have a well, windmill and large supply tank for every 2,500 sheep, and I favor the placing of small tanks out of which the sheep drink under the shed in such a way that one of them will supply two lots. By putting them under cover they will not be liable to freeze over, and if you bank them up well with manure and have a tight cover you will be but little bothered by ice.

"I have always believed in sheds open to the south, and we have enough shed room for all of our sheep. Some feeders think differently, but I can sleep better and fell easier during a sleet or snow storm when I know my sheep are dry and comfortable. I favor a comparatively narrow shed—say twenty to twenty four feet wide—running along the north side of the pens. In this way you obtain a great deal of shelter. About three or three and one half square feet per sheep is ample room to figure on in building your shed. A well constructed pole and straw sheed answers the purpose very well.

"The purchase of your feeders is the first important thing after you are ready for them, and nowhere is the old adage more true that 'a thing well bought is half sold.' Usually there is a time in the fall when you can buy wethers, ewes and lambs at the river market cheaper than on the range, and I would especially recommend this course to the new beginner, who only feeds a few loads. Go to a reliable commission house which makes sheep a specially, and tell them what you want. Of course a good plan to be there yourself and see what you buy, but they will generally save you much more than their commission in making the deal for you. If you buy on the range, be sure and buy by weight, as in almost all cases sheep are overestimated when bought on the prairie.

"Although scabies, the dread of sheepmen, is now well under control,, thanks to the efficient services rendered by the Department of Agriculture, and especially by Dr. Salmon and his able corps of assistans, it is best to have your sheep dipped before shipping them in the country. Where several thousand are being fed a dipping plant should be built by all means, as scab may break out at any time. There are several good prepared dips on the market, and the old lime and sulphur dip, although a sure cure, is now seldom used in the feed lots.

"We generally manage to run our bands in the cornstalks and cornfields for a month or so before putting them up. One man who understands his business and has a well trained dog, will easily herd 3,000 head. Be sure you have them well filled before you turn them into an unhusked cornfield, and never let them get hungry. A band of big wethers are splendid huskers, and besides cleaning the field thoroughly they board themselves.

"When putting them up for good we do not like to have more than 500 in a lot, and 300 is still better. We always keep salt before them. If the sheep have been in the cornfield they will eat the corn in the yards at once, and there is little danger of overfeeding. If not, they should be started slowly, and the ration increased gradually until they eat about a pound and a half per day.

"As mentioned before, a ration of shelled corn each day and a little bran or meal, is my favorite ration. We feed grain three times a day. One man can easily attend to 2,500 head in the feed lots. Alfalfa is by far the best roughage for sheep. Where this is not available prairie hay, sorghum or kaffir corn do very well—in fact, I have made very fat sheep on nothing but corn and bright wheat straw. Sheep will get sick and die, and I have never been able to doctor them to any advantage. Regulation in feeding and change of feed is a good preventive. Losses from death should not exceed from ½ to 1 per cent a season.

"In marketing your fat sheep you should again show conservatism. In my long years of experience I have found that whenever you have a fair profit you should let go, when your sheep are fat and ready for the shambles. A short feed, generally more profitable than a long one, even if the market should go up a few notches. We have had several good years in the sheep feeding business and I am afraid this fall "fools will rush is where angels fear to tread"—with an apology to the angels.

"Don't be in too great a hurry to buy, I think there will be plenty of feeders to go around, and next spring you may be glad you did not get all you wanted.

"I believe I have told you about all I know about sheep feeding, and I hope you will ask me any amount of questions, which I will answer to the best of my ability.

"Will you bear with me if in conclusion I digress a little and touch upon a subject which, although closely allied with our interests, does not pertain exactly to sheep feeding?

"We have of late heard so much about the 'beef trust,' which of course, also includes mutton. I own no stock in any packing house and am not here as an advocate of the packers. But I am a firm believer in the inexorable law of supply and demand, and I also believe that the surplus to a great extent determines the price.

"America is still, in spite of the great increase in our manufactures during the last decade, and agricultural community, the products of the farm ranch and plantation forming 60 per cent of our total exports. The exploitation of foreign markets is therefore a matter of prime importance to our farmers and stock raisers. This work is carried on to an extent that is perhaps not generally realized outside of the larger packers and firms engaged in the export trade. It may bring the truth home to us more clearly if I mention some details obtained from one of the big packers.

"It is the practice of this firm to have representatives continually visiting the many markets of the world where sale of American meats is possible. In some of those markets where the trade in American meats is long established, with salaried men of ability and knowledge of the business in charge.

'But the greatest attention is given to those markets where our products have as yet obtained only the slightest footing and where their sale is attended with many obstacles. To such places men expert in their particular line of business are continually going, at great expense, and, too frequently, with discouraging result. In this manner, however, new markets are continually being opened to us, and the customary experience is a gradual growth in trade with such places unless when legislation in the shape of prohibitive import duties, intervenes.

"Several foreign countries at the present time have absolute or restrictive tariff on our meats. For instance, Germany absolutely prohibits the importation of canned goods and sausages. Dressed beef, mutton and pork must consist of the entire animal, accompained by the lungs, heart, liver, kidneys, etc., in one piece. Cured meats are burdened with heavy inspection fees, which in some cases increase the import duty about 100 per cent. In France the duties on American meats were recently increased 80 per cent, which practically prohibits importation. The duties in Austro Hungary, Italy, Spain and Switzerland are nearly prohibitive.

"During the last two months one packing firm had two representatives in one or the other of the Chinese ports through which supplies to the belligerent armies in Manchuria have been passing; another at Mukden, cheering our Russian friends with visions of Chicago beef in ship loads; still another in Japan, where the native supply of meats is becoming exhausted—which is a fair representation of what all packing firms are doing.

"So much for Asia. In Africa there was one man going down the west coast to Cape Town while another was coming up the eastern side of the continent on his way back from the cape.

"In Europe there were at one time six of their men headquarters in Chicago; another man was in South America; two in Central America; two traveling throughout the West Indies islands; one in Mexico and one in Porto Rico.

"In addition to these special representatives making foreign trips the firm has local salaried representatives or agents in every market of importance throughout the world. These trips are in themselves ununprofitable. They involve a big expenditure in time and money. But the packers seem to be alive to the necessity of providing a large outlet abroad for the increasing supply of packing house products, and no doubt hope to benefit in the future from their efforts now.

"In the arraignment of the packers a great many sensational and untruthful statements are now appearing in the public press.

"For instance, in an article in the April number of Success, entitled "The Private Car Abuses,' by Samuel Merwin, he makes the statement that dead hogs are removed from the stock yards and rendered into lard, and that the packers are deliberately selling diseased meats, inspection having been discontinued. Any one with the slightest knowledge of this line of business knows these statements are not founded on fact, every animal being government inspected.

"Mr. Merwin further states that this kind of product is forced upon the people because the packers control the transportation of all perishable products.

"I asked one of these writers of fiction why he did not write the truth, and he coolly informed me that the truth did not pay because the people wanted something sensational.

"Let us exercise conservatism in our judgment of the packers as well as in sheep feeding and we will be more happy and more prosperous for it.

CORN AS SHEEP PASTURE.

PROF. THOMAS SHAW, IN AMERICAN SHEEP BREEDER.

Corn is seldom used for providing pasture for sheep and yet it may be used so when occasion calls for it. Where sheep are grazed on the extensive plan it will seldom be required for such a use, if indeed ever, but when confined to small areas it may be thus used sometimes with much advantage. It may be made to furnish a large amount of grazing relatively on a small area and at a season when other grazing may not be plentiful as for instance during the dry hot weather of summer.

One great benefit from such grazing arises from the short time in which it grows. This makes it possible to sow it after winter rye has been grazed down in the spring, and to follow it with winter rye in the autumn or with some other crop that will stand the winter climate in the locality. In the northern states winter rye grazing will be completed about the end of May or early enough in May to admit of sowing the corn that follows about June 1. Warm weather is then on and the corn grows rapidly, so rapidly usually, that it will be ready for grazing in about fifty days from the date of sowing and in some instances in forty days. The grazing will then be on in July and will last through August, and if a second sowing has been made elsewhere later, it will carry on into September until the season of frost. There is then time to follow with rye should it be so desired.

Corn may be sown to provide such grazing on the broadcast plan, that is may be sown by hand, or what is better with a grain drill all the tubes in use, when the drill is capable of sowing seeds so large. The depth to bury the seed should depend largely on the condition of the soil at the time of sowing as to moisture. The seed must be buried deeply enough to reach moisture. If the weather is dry at the time of sowing the seed, the roller can generally be used with advantage both before and after sowing. If the seed is broadcasted by hand and covered with the harrow, much of it will fill to germinate in vary dry weather. From 1 to 1½ bushels will be enough to sow and of any variety that grows well in the neighborhood. Before the corn is up, the surface of the ground should be well stirred by a weeder or by a harrow with the teeth aslant so as not to pull up the corn. Stirring the soil thus will destroy myriads of weeds and will lessen the escape of soil moisture. Whether a second stirring of the surface should follow a few days later must be determined by the relative good and harm that will follow under the conditions present; usually however, if the ground is thoroughly stirred before the corn appears, it will subsequently keep weeds well in check by its rapid growth and abundant shade. Whether any other seed should be sown at the same time will depend somewhat on how soon the ground is to be ploughed after the corn is grazed down. If several weeks are the interval, before the next ploughing, it may on good soil be advantageous to sow two or three pounds of Dwarf Essex rape seed, not long with the corn, but just before the harrowing referred to is given. The rape plants will probably be much crowded by the corn but after the corn is eaten they will probably provide considerable pasture. In the middle and southern states it may be well to sow sand vetch seed with the corn, at the rate of say one-half bushel of seed per acre. After the corn is eaten the vetch should furnish autumn grazing and also the following spring. The writer has tried sowing rape seed in corn for grazing, but not the sand vetch. The latter, however, should succeed well under the conditions named.

The corn should be allowed to make considerable growth before the grazing begins. When grazed down after the plants have formed a joint they will not grow again like the sorghums, and if grazed before they joint, subsequently growth is weakened. The stage of advancement should depend somewhat on the area to be grazed and the relatives size of the flock. If the desire is to consume all the pasture, then the grazing should begin reasonably early, but if it is only intended to consume a part and plough down the rest to bring humus to the land, then it should begin later. Usually the corn may be considered ready for grazing when it is as tall as a mature sheep. The sheep will break down not a little of the corn but they will consume much of that broken down when it cures. If the area is not too large they will in time practically clean up the pasture. They should not be grazed on the pasture when it is wet for reasons that will be obvious.

I do not wish to be understood as advocating the sowing of such pasture in preference to some other pastures that may be named, as for instance rape. But corn may be grown under certain conditions where rape would fail. Rape on good ground will make about as much grazing as corn in a normal season and the quality will be better. The quality of the grazing furnished by lequmes is also superior. Nevertheless, corn may be grown to provide grazing for sheep with decided advantage in certain instances, three of which will be discussed.

First, it may furnish grazing when other plants would probably fail to grow. For instance it may be possible to get a stand of corn when the surface soil is so dry that rape and sorghum would not start. Corn can be buried more deeply than either and it is a much stronger plant when it begins to grow. It will also make a reasonable growth in soils too poor or too much worn to make even a reasonable growth of rape.

Second, it may be grown with much profit when the object is to improve land quickly and cheaply that will not grow even red clover. Poor sandy soils are of this class. Such improvement may be made most readily in conjunction with rye pasture. Rye will grow more or less on almost any sandy soil when moisture is present. The plan would be to sow winter rye early in the autumn and graze it down with sheep the following spring. Then drill in corn as outlined above and graze this down. Follow the corn with winter rye again and in the next spring sow clover on this rye. It would pretty certainly grow in a normal season, and when once clover grows on such land the victory is won. One cannot well imagine a cheaper way of bringing up such land, as the grazing obtained ought to pay for the seed and labor. In fact it should be worth more than the cost. The fertility thus brought to the cultivable area would be clear gain.

Third, land may be worn, weedy and much in want of humus, and it is desirable to bring it quickly into a condition to grow some marketable crop. The same plan may be followed as outlined above, with the difference, that the greater portion of the corn or at least a large portion of it is buried in the soil, or, should it be desired to cultivate more and graze less, the land could be ploughed in the fall, worked like a bare fallow in the spring until about June 1 and then sown to corn, the residue of the corn being ploughed under after grazing it for a time. But it would certainly bring up the land more quickly to grow both rye and corn and bury the residue after partial grazing in both instances. In this way the labor bill of drawing and spreading manure may be avoided by making the soil and the sheep produce the fertility and also do the distributing of the same.

SHEEP GRAZING IN CORN.

PROF. THOMAS SHAW, IN AMERICAN SHEEP BREEDER.

Corn is grown not only to provide grain and fodder for live stock, but it is also grown with a view to clean the soil. Thus, where corn is grown, the benefits to the soil in consequence have come to be looked upon as much the same as those which result from a bare fallow. As a rule more stirring is given to the soil when growing a crop of corn that is cultivated both ways, than in caring for the bare fallow. Stirring the soil thus frequently liberates fertility, which was before inert, hence when a crop of grain follows corn, it can easily obtain the necessary food. This, in connection with the cleaning given to the land in a majority of instances, insures a good crop.

But it frequently happens that the corn crop is not clean. In some instances the season has proved so wet at the time that the cultivation should have been given, it could not be done properly. In other instances the farmer has been so occupied that the corn crop could not be properly cared for. In yet other instances, it may be well cared for up to the time when cultivation ceases because of the height of the corn, and subsequently weeds spring up and mature before the crop is ripe. Persons living in the east and accustomed only to reasonably heavy soils will scarcely believe that weeds could start and mature thus quickly in any soil, and yet this is a very common occurrence in many sections of the Mississippi basin. In some areas it is quite as common to see much of the corn foul with weeds as to see it reasonably free from the same. When it is so the cleaning of the land is not affected, and thus far our object in growing the corn is not attained.

Where land is fenced, sheep and lambs may be used with much effectiveness in preventing such weeds from going to seed. Lambs are considered preferable to old sheep because they do not soon learn to molest the corn, which in some instances old sheep do and when they do of course they have to be removed. But under some conditions both sheep and lambs can be used with decided advantage in doing such work, especially when the variety of corn grown is tall and stands up well.

The plan of turning lambs into such field at weaning time is an excellent one. They should of course be turned in while the weeds are yet young and tender. They will then crop them down and in doing so will render the most munificent service to the field. They will also crop off the lower leaves of the corn and in this way will obtain much food without probably doing any harm to the corn. The shade furnished by the corn at that season of the year when the weather is usually hot will be good for the lambs.

When lambs newly weaned are turned into such fields it may be necessary to supplement the food given to them. It probably will be necessary. The weeds grow much in the shade and in consequence will be more insipid than when they grow in bright sunshine. Even when newly weaned lambs are turned in to graze on good pasture, they should as a rule be given a supplement of grain. When they pasture amid corn, if thus fed, the lambs will not only be directly benefitted, but the fertility added to the land, or some of it, will be proportionately helpful.

In some instances, however, it is not practicable thus to pasture lambs amid the corn crop. If the variety grown is short, they would soon learn to eat the tassels and ears. If wind has blown over the corn, or some of it, the same result would follow. If the corn is wanted for silage or fodder it is so far objectionable to have the leaves stripped off by the lambs for some distance up the stalks. And in wet weather it would be detrimental to the lambs and to the ground to graze sheep or lambs thus.

The plan should be a good one that grazed lambs thus amid corn and gave them access at the same time to a field of rape. When not grazing on the rape they would seek the shade and the cool soil beneath the corn. They would also roam occasionally all through the corn field in search of weeds, or weed seeds, with the result that the corn would be benefited while the lambs were growing fat.

One of the most difficult weeds to prevent from going to seed in corn is what is known by the various names of foxtail, summer grass and pigeon grass. It will spring up in corn after the latter is laid by for the season, and under favorable conditions will be in head in four or five weeks after it reaches the surface of the ground. At that season it is not usually so succulent as in the month of June, hence unless lambs have access to it, while not yet headed out, it becomes so woody that they do not take kindly to it.

Some farmers, but not many, thus call in the aid of sheep and lambs to glean weeds amid the corn. Why is the practice not much more common than it is? Of course the want of fences is one obstacle in the way on a majority of the farms in grain growing areas, and the relative scarcity of sheep is another. But even where a small flock of sheep is kept on a farm, it is seldom used thus. The only other practical way of removing such weeds is with the hoe. With prices of labor as at present, this would not be practicable. As a rule it would not pay.

To the farmers of the northwestern states this question is one of much importance.

The soils of such lands are weedy, very weedy. Their condition is simply a disgrace to the farming practiced there, and on many farms it is becoming worse. This is putting it strongly, but I will not modify the statement. Men ought to be ashamed to allow their farms to remain in such a condition with weeds. It may not be the fault of many of those who till them that they became so, but it will be their fault if they remain so. Corn is one of the most effective cleaning crops that can be grown, but it requires no argument to show that corn will not clean farms while weeds are allowed to go to seed in myriads in very many of the corn crops grown. More fences are wanted to hedge in sheep. More sheep are wanted to glean amid the corn fields. More corn fields are wanted to aid in cleaning the land and more farmers are wanted with the determination to have clean farms. Sheep must be given the opportunity to do what they can in helping the farmer to fight successfully the battle against weeds in this age in which a knowledge of the use of the hoe is becoming a lost art.

FEEDING SHEEP FOR MARKET.

JAS. REA, BEFORE THE ANNUAL MEETING OF THE EASTERN MONTANA WOOL GROWERS ASSOCIATION, 1905.

"Western sheep or lambs direct from the grazing grounds have never eaten a bite of any kind of grain, and they don't know the taste of it, no more than you or I know what a bite of the moon would taste like.

The sheep that are fed on the 'full feed' plan are put in large sheds which contain long troughs full of grain, and racks full of hay. The trough is so constructed that the grain runs down where it can be reached by the sheep night and day. Some of this feeding is done in open pens, but generally the weather will not permit this outdoor feeding.

"Although fresh off the cars and hungry as wolves from the long journey they will turn from the grain, because they do not know what it is, and dig into the hay to satisfy their hunger. After filling upon the hay they go nosing around the pen to see what there is to find, and they nibble on the grain now and then, and about the time they realize what it is they are on full feed, eating all they can. It takes from three days to a week to get sheep or lambs on full feed. A light feed is given for the first two weeks or a month, and then increased in quantity as the feeding period reaches an end. Lambs require a lighter feed than old sheep.

"Sheep off the range in ordinary condition should be on full feed from sixty to ninety days to make them prime. They can be made fairly good in less time, but if they are thin when put on feed it will take longer. The feed used at most of the large feeding yards is upland prairie hay, wheat screenings, and ground corn.

We find it pays to grind the corn, and sheep make better gains on that than on whole corn.

"The best grain ration we have found to finish sheep on is one-third corn meal and two-thirds good screenings by weight. Sheep eat on an average four or five pounds of grain per head each day, together with half a pound of hay—lambs about a pound of grain less than this, together with about one-third of a pound of hay.

"When starting on feed they eat a great deal of hay, but as they grow fat, and the feeding period reaches an end they eat less hay, and when a sheep or lamb is prime fat they eat very little hay, while they have access to a self-feeder of grain.

"Salt is before them at all times, and there is a great, large trough of fresh water in the center of the shed where they can drink nice, clean water all day. The trough has a patent regulator, by means of which it is kept full of water all the time. The regulator is a simple affair, and can be put on any water trough which is fed from a supply tank. The trough is cleaned out every morning and kept as clean as possible. This is more important the longer the sheep are on feed, as they get very particular. I have seen them get so nice they would go thirsty before they would drink out of an untidy trough.

"A lazy man will never make a sheep feeder. A lazy man is never a success at anything.

"The kind of salt we use is the ordinary Michigan white, No. 2 granulated. It comes in barrels of 280 pounds each. We have tried other kinds, but we find this is the most economical and handy.

"Before I go further into this subject I want to call your attention to a simple, but an important fact about watering western sheep. Sheep that are bred and raised on the open range in ninety-nine cases out of a hundred never drink water out of a water trough except those natural ones shaped by nature's hands. The shed that they are fed in is not as light as out of doors, and the trough is protected by a board overhead to keep some eager, thirsty sheep from standing in it, and making the water dirty. The water may hiss and trickle down in an inviting sort of way, but yet Mr. Sheep from the range is not on to the newfangled ways of civilization, and is too timid to drink.

Persons that have never fed any will hardly believe it, but I have seen sheep actually perish within easy reach of water. The way we remedy this is the second or third day after the sheep are put on feed, and any sheep that is gaunted up, and looks like he has not had water, we take him up to the trough, put his nose in the water, and put a finger between his lips, wriggle the finger a little and Mr. Sheep will drink with such fierceness that you think he will hurt himself. If this plan is not successful we use a common beer bottle—placing the neck of the bottle far down the sheep's mouth, tip its head back, and it has to drink.

The death loss from all causes while on feed is about two and one-fourth out of a thousand.

It is not profitable to feed sheep over three months on a full feed of grain. Sheep can not be kept a long time on a heavy grain ration like cattle. After five months or even less they get so fat they die.

If you wish to prolong the feeding period you must use a light sort of feed; or use more hay and a limited amount of grain. This leads me to a system of feeding resorted to in Colorado, Utah, and our own valleys, where alfalfa hay plays an important part.

All this feeding of alfalfa hay is done in open pens without covering of any sort, but the pens are placed in some well sheltered spot in some ravine or grove of trees.

In the large feed yards near St. Paul and elsewhere the grain is fed to the sheep in great self-feeders where they can eat night and day if they wish to. The sheep fatten very quickly under this system, but the idea of feeding alfalfa hay is to prolong the feeding period by only giving a limited amount of grain each day, and thus put on a great amount of fat at a small cost.

Colorado feeders have come to Montana, bought lambs here, taken them home, and fed them alfalfa hay and grain. Under their system of feeding they have topped the markets of the east the past few years, and have created a demand for their lambs that is astonishing.

Suppose it is half past 3 or 4 o'clock in the afternoon, more grain is fed as before. After their grain is eaten, back to hay they go, which is again scattered for the fourth and last time. It is now getting dark in the short fall days, and the water troughs, which have been kept full of water all day are now emptied to keep from freezing.

Sheep must be carefully trained to eat a particular sort of grain in large quantities, and a sudden change is very disastrous. Any change must be done carefully and slowly.

LAMBS THAT PAID WELL.

F. E. and E. D. Baker, Green county, Illinois, in Breeders' Gazette, 1905.

The carload of Western lambs we had on the Chicago market Jan. 9 were part of 675 head raised in Utah and purchased on the Kansas City market; 337 of these lambs were purchased Oct. 12, weighing 17,860 pounds at $4.15, and 338 Nov. 1, weighing 18,850 at $4.35. The total cost of the lambs after paying commission, dipping and freight was $1,669.40. When we received these lambs they were turned on a good blue-grass pasture for two days when they were well filled and rested and were then turned in a forty-acre cornfield in which there was a good growth of dwarf Essex rape. The rape seed was sown broadcast just before the corn was cultivated the last time at the rate of five pounds per acre.

We gathered half the corn in the field and the lambs did not consume more than half the corn left or about 500 bushels in all. This was all the feed they received from the time we received them until they were sent to market. We had an exceptionally fine dry fall and winter and the lambs did not waste any corn, but had the field become muddy we would have taken them out and fed them in troughs, as we usually finish our lambs—by feeding shelled corn, oats and linseed-meal. The lambs were taken out of the field each night and placed in a lot where there was plenty of shelter, water and salt. Where lambs are turned on green feed of any kind it is very essential that they have plenty of salt at all times and this lot consumed about one barrel of salt per week.

Two of this lot of lambs died from the effects of dipping, two were killed by dogs and three died from other causes, which was a very light loss. We sold on Dec. 19 in Chicago 20 lambs averaging 75 pounds at $6.50, and on Jan. 5 in East St. Louis 129 lambs weighing 72 pounds at 7 cents in Chicago on Jan. 9, 481 lambs averaging 68 pounds at $7.25 and 38 lambs averaging 60 pounds at $6.00. The total weight of the lambs when sold was 45,910 pounds or a gain of 9,200 pounds—about 14 pounds per head.

While this gain was not large it was very satisfactory and with the advance in price made a nice profit. After taking out shipping expenses the 668 lambs sent to market netted $3,086.45. Take from this the first cost, $1,669.40 and $200 for corn, $40 for rape and $10 for salt and we had left a net profit of $1,167.05. We fed besides this lot of lambs 200 native lambs and 180 native sheep, which were sent to market in December and we have on hand at the present time 300 Western lambs and 200 native breeding ewes. We expect to feed the Western lambs until about May 1, when they will be sheared and sent to market. The ewes were bred to have lambs in April and will be sent to market just as soon as their lambs are large enough to sell for spring lambs or about the middle of June. These ewes were purchased here in the country about Oct. 1 at 3 cents per pound and averaged 115 pounds. We expect this lot of ewes to make us more clear profit than any lot of sheep or lambs that we have handled as they should shear over $2 worth of wool per head, and last June we sold ewes not as good as these on the East St. Louis market that had raised lambs at $5 per cwt. We do not try to raise any lambs to feed, as we prefer to buy Western lambs as they are so much stronger and healthier and losses are not so large. We tried feeding from 5,000 to 10,000 lambs a year at feeding stations, but found it took about all the profit to pay for screenings and the last few years we have fed what we could handle well on the farm and have always made a good profit. We do not expect to do as well another year, as feeding lambs will be higher, but we will feed at least 2,000 as they will consume much feed to better advantage than either cattle or hogs.

RATION FOR LAMBS.

JOHN A. CRAIG OF TEXAS EXPERIMENT STATION, IN BREEDERS' GAZETTE.

R. M. W., Saline, Mich., writes: "What mixture of the following feeds will produce the largest and most economical gains on lambs weighing about 65 pounds when put on feed: Corn at 50c per bushel; oats at 30c; bran at $20 per ton; cottonseed-meal at $27 per ton; linseed meal at $29 per ton? How much per head should I feed per day? Rough fodder is limited to good oat and wheat straw and shredded corn fodder during the first half of feeding period, and fine timothy hay during second half. The intention is to feed about five months and to shear the lambs at the end of the fourth month."

Of the feeds mentioned I would select the oats, corn and cottonseed-meal. I would only use the oats at the beginning of the feeding, as they are a very safe food to start lambs on. I have never found them to give very satisfactory gains in a fattening ration, but undoubtedly they are a very wholesome food and are especially useful in starting lambs on grain that have not been accustomed to it before. They are comparatively cheap at the price mentioned too, and I should certainly prefer them to the bran for the same purpose at the prices mentioned. The corn and cottonseed-meal at the prices mentioned are the two that I would try to make the major portion of the ration. I have never fed cottonseed-meal except in combination with corn to the extent of one part of cottonseed-meal to two parts of corn-meal by weight. The lambs made very satisfactory gains on this, making nearly three pounds per head weekly.

I would start the lambs on oats alone and after feeding them about a week on this I would introduce a little corn, about a quarter of a pound per head per day. At the end of two weeks they should be eating this ration with relish. At that time they will be taking about a half a pound per head daily, which would consist of one-half oats and one-half corn by weight. If the lambs are exceedingly eager for the ration, in the course of a week I would divide this into two feeds and give them one-half per head daily of the mixture. In the course of another week they should be taking about a pound per head daily divided into two feeds. I would then begin to introduce the cottonseed-meal, giving them a quarter of a pound per head daily in the mixture of corn and oats. If the lambs continue to do well and eat the ration eagerly I would get them onto a ration consisting of two-thirds corn and one-third cottonseed-meal as soon as possible. At the end of the feeding period they will probably be taking as much as two pounds per head daily divided into two feeds of one pound each. The rough fodder that your correspondent has is not very satisfactory, the shredded corn fodder I believe being the best of that which he has. If he could possibly secure some clover for roughage it would make a very satisfactory addition to such a ration. There is a great deal of prejudice against the feeding of cottonseed-meal. I notice that those who have never fed it are very fearful of its killing their stock. There is absolutely no danger of this unless there is too much of it fed. If cattle are fed continuously on cottonseed-meal and get too much of it, then some of them are likely to die but this is clearly attributable to feeding too much of the meal continuously. If it is fed properly with corn to sheep or cattle I do not think that there is the least danger connected with its use. Of course it is an exceedingly rich food, about the richest in protein that is available, and consequently if fed heavily alone it is going to produce injurious results.

FEED FOR EWES WITH LAMBS.

J. Hal Woodford, Bourbon County, Kentucky, in Breeders' Gazette.

H. C., Mt. Pleasant, Tenn., writes: "What is the best feed for ewes with young lambs? The lambs are not old enough to eat. We depend on wheat fields for winter pasture but this year the wheat fields are covered with snow and ice and grazing is not good. I have 150 ewes and 100 lambs from a month to a day old. I am feeding one feed of sorghum silage and 100 pounds of cottonseed-meal a day and one feed of ground barley. Could I feed anything that would make the ewes give more milk or that is cheaper? How much meal should I feed and how much ground barley? Will have to feed until April 1."

The sheep is a very delicately organized animal, its stomach in its entirety, being the most wonderful organ conceivable. In its ration the desideratum is to get the proper nourishment in the bulkiest form ecceptable to the animal. The stronger and more concentrated the food the greater it seems to appeal to their taste.

The great density of your correspondent's ration would be my chief objection, admitting, however, that I never fed cottonseed-meal, nor is it ever fed to sheep in our locality. However, two-thirds of a pound per day to be continued until April 1, in addition to feed of barley, another very rich food, seems a very badly balanced ration. Our ewes began lambing Feb. 1 and since have never been out of the shed—something very unusual in this latitude—but we have not lost a single ewe this winter, nor lamb except the first pair dropped before we expected them.

We feed 1½ pounds of ground oats and ½ pound of ground corn (I believe barley or rye just as good), and then all the good sound clover hay they will clean up. Timothy hay is a slow death but nevertheless a sure one if the only roughness fed, as it is very constipating. They should have access to pure water and salt, as a sheep will drink a greater per cent of water in proportion to weight than any other animal.

Unless the weather is very inclement turn the sheep out in the pasture where they can dig and paw the snow for grass or roots of grass, it freshens them up and they will come back to shed bright and hungry. Wheat is not luxuriant enough for winter pasture except say one year in five, but if your inquirer will try rye he will find it will hardly fail him once in a decade. We set our drill at one bushel per acre and after a rain has softened the ground sow rye over our clover fields. Sow two bushels after corn. Now our wise Northern shepherd would have his beet cellar to fill this want, and we have fed the mangels with enitre satisfaction here.

The foregoing brings to mind that lambing is here, the time of greatest anxiety to the shepherd, especially when lambs here at the scales will bring $5.50 delivered in July, so a few lines may be of benefit to some. Half of the battle is won if we have our ewes strong in flesh, which we do by giving them first ½ ear to 1½ ears of corn during December and January while they run on pasture and not wait until the bleat of a hungry lamb gives us warning that there is no milk in the udder. We now need two pastures and two sheds, never turning a ewe with the flock after dropping her lamb. This prevents the lamb from being run over or going astray with the flock and failing to be claimed afterwards.

Upon finding a chilled lamb the old way was to wrap it up and lay it before the fire, but if you will heat a kettle of water almost too hot to bear your hand in and submerge the lamb up to its throat and gradually let it cool, in 30 minutes you can rub until nearly dry and take it back to its mother. If twins, subject both to the same process, else the mother will be able to detect a difference and disown one. A shepherd up-to-date will never let a ewe that has dropped a lamb and lost it fail to suckle if any other ewe has two. Skin the dead lamb and place skin like a blanket over the lamb you wish claimed, tying it on securely around throat and legs, being sure to let it drop well down behind, as it is here the mother smells when lamb is nursing, and your object will be accomplished in 24 hours; cut the skin off as soon as you are satisfied. Put the mother and lamb from sight of flock when you are doing this, as she will be more likely to concentrate her affections on the lamb if this is done.

Fix a lamb creep any way to exclude old sheep, sprinkle a little bran in troughs and you will soon have your lambs eating. One important matter about troughs: never use the V-shaped trough, as it hoppers the food down so they will gobble it too fast. Get a plank for the bottom 12″ to 15″ wide. Owing to the high price of lambs in late years we have very few carried over into yearling form, but the best gains we ever made was to let them follow cattle fed on shock corn. I am carrying a small bunch of Cotswold rams that way now and they are doing finely. We sheared them in August to relieve them during excessive heat of late summer and fall.

We are having a very hard winter and sheep and lambs are dying, some having lost quite 25 per cent.

D---Regarding Poultry.

POULTRY RAISING.

Ethelyn Benson, Sidney, Iowa, before the Fremont County Farmers' Institute.

Not long since a writer who was preparing a paper, called at the home of a prominent women and made known his errand. "Madam," said he, "I am preparing a paper entitled 'How to Raise Children'; knowing that you are the mother of six, I hope you will aid me from your knowledge and experience." "You are mistaken," the lady replied, "I am the mother of siv children, but I do not know how to raise them. My old maid sister knows all about it." Like the old maid sister of the story my paper is based somewhat upon theory and observation.

We count chickens many times—most often before they are hatched. Visions of the many necessities and luxuries those yet-to-be-hatched chicks will supply, feast our minds as we trudge wearily to and from the hen house many times a day. Alas! how those visions begin to fade and disappear when the hen clumsily breaks half the eggs, leaves the nest just as the eggs begin to pip, or ruthlessly crushes the life out of their fuzzy little bodies in her anxiety to care for them.

Then when those surviving chickens have attained to the age of "fryers", how we count them when there is to be a family reunion or a Fourth of July picnic and we wonder if there will be fried chicken enough. Yes, we count our chickens many, many times before they are finally disposed of, and cannot be sure of them until they are delivered to the poultry dealer. The writer started for town with two dozen fat fryers, and happening to look back, we beheld our chickens taking unto themselves wings and escaping through an opening in the crate where a slat had slipped aside. We did not catch all of the truants.

A chick's live is one of tribulation from the time it pips the shell until we serve it, juicy and savory at our Thanksgiving or Christmas dinner. Rats, weasels, skunks, 'possums, hawks, mites, lice, and all the diseases chickens are heir to.

Then the sudden summer showers. When it is over, we don mackintoshes and rubbers and sally forth in search of the victims. Under this gooseberry bush we find six. There under the drip of the roof are ten more that stood there with bills open trying the "water cure" until they were "too full for utterance." Around the corner we found five more

All these we carried into the house, turned them heads down, held their bills open and let the water run out. After that they were wrapped in a warm cloth and put in a warm place. Of this unfortunate twenty-one we saved fifteen.

Then a careless feeding. A friend of mine, newly turned poultry raiser, heard that meat is good for fowls. She boiled a ham, and not to waste the rich liquor left, soaked bread in it and fed it to one hundred thriving chickens. Result: seventy-five cold in death in less than a half hour. She now knows that a quantity of salt in any form is fatal to chickens.

It is said that every one sometime during his life is attacked by the poultry raising fever. I had my first attack one year ago and I am still under the spell.

I wonder if your incubator experience was similar to mine? According to directions I experimented with the incubator for a week before putting in the eggs. Then very carefully I put in fifty eggs. To be sure that the temperature varied but little I watched the thermometer closely by day and twice every night. During the six weeks in which I operated that incubator (for I tried it twice) I became so accustomed to looking at the thermometer at night that several times I waked to find myself up and groping my way toward that hatching machine.

At the end of the first three weeks I took out twenty downy chicks. (Of the original fifty eggs, I tested out twelve as infertile at the end of twelve days.) A motherly old hen immediately adopted these chickens, and thus was my first venture with poultry launched.

The food we gave these chickens was a prepared chick food that we bought here. We fed it dry and it proved to be an excellent preparation. The chickens thrived and there was but little bowel trouble among the flock.

At the end of the second week we began mixing dry ground corn with the prepared food, gradually reducing the proportion of prepared food and increasing the corn ratio until by the end of the third week they were on a ground corn ration. We continued to give the prepared food occasionally; perhaps two or three times a week, as a change. The chickens continued healthy and the dry, ground corn proved satisfactory, and was more economical than the other preparation.

As the chickens grew and thrived we reduced the feed, thus making them rustle for themselves. Most of the time during the summer they had two small feeds a day; one in the morning and again at night. About once a week we mixed a quantity of beef scraps with bran, moistened it, and fed it to all the poultry.

The hen is one of the most valuable assets of her owner. Given warm, clean, dry, sunny quarters, proper food, and clean, fresh water (warm in winter), the hen will soon pay for herself many times over. Where poultry has free range in the summer, they need be fed but little. See that they have an abundance of water and good dust baths. Of course we all know that grit in the form of gravel, sand, or ground oyster shell must be before them constantly.

In the winter, when the fowls are necessarily confined to a limited range, they must have more attention. Above all, the quarters must be kept clean. We find it an excellent plan to sprinkle air-slaked lime on the ground after the building has been cleaned. It serves as a disinfectant, and, too, the fowls will eat some of it. We kept a box of air-slaked lime standing in the hen house all summer where the poultry had free access to it.

Beside cleanliness, winter quarters must have four other requisites: warm, sunny, dry, and be well ventilated.

To keep hens active, which is the secret of their winter laying, they must have exercise. Dry litter, such as leaves, or fine straw, may be thrown into the hen house. Into this, every morning, scatter a few handfuls of small grain, as wheat, millet, or speltz. They will scratch and hunt all day. Then, too, a cabbage head hung high enough that they must jump to reach it, will give them exercise.

An armful of clover or alfalfa hay thrown among them in the morning will be stripped of leaves and blossoms by night. Once or twice a week we give a hot bran mash in which has been mixed a quantity of beef scraps.

Sunflower seed is also a good feed, but should be fed sparingly. Corn may be fed occasionally, but it is not good as a steady diet, as it is too fattening, and fat hens will not lay.

Here are some simple remedies that may help some of you in your struggles with mites and lice:

During the day time most of the mites leave the poultry and may be found clustering on the under side of the perches. At night they prey upon the poultry. A kerosene torch, similar to those used in former political torch-light processions, is used. Light it, and hold it under the perches, moving along slowly. The heat reaches all cracks and crevices that it is impossible to reach with a liquid exterminator.

The lice remedy we have not tried, as we are not troubled by that pest. This is the remedy, however: A pound of moth balls dissolved in a gallon of kerosene and applied to the roosts once a month in said to be effective.

For roup: Muriate of iron, applied to their throats with a swab will cure the disease.

Statistics are usually dry and uninteresting, but we want to give you a few concerning the Kansas hen. What is true of the Kansas hen may also be said of the Iowa hen. "Here is one year's work of the Kansas hen. $7.226,111, to say nothing of 'broilers' and other by-products. Kansas hens make more money for Kansas than do her sheep, wool, barley, flax sorghum, oats, and potatoes."

A sugestion as to the method of disposing of your blooded fowls (for we all have satisfied ourselves that a mongrel fowl pays no better than a scrub hog, sow, or horse). Advertise. If you want to reach the local trade use the columns of your local papers. If you wish to reach a wider list of poultry raisers and fanciers, advertise in a good poultry journal. But advertise.

Now as my paper is somewhat lengthy for an amateur poultry fancier, I will bring it to a close with a clipping entitled

"DRIVING A HEN."

"When a woman has a hen to drive into a coop, she takes hold of her hoops with both hands, and shakes them quietly toward the delinquent, and says, 'shoo there.' The hen takes one look at the object, to convince herself that it's a woman, and then stalks majestically into the coop, in perfect disgust with her own sex.

A man don't do it that way. He goes out of doors and says 'It is singular nobody in this house can drive a hen but myself,' and picking up a stick of wood, hurls it at the offending biped, and observes, 'Get out of there, you thief.' The hen immediately loses her reason and dashes to the opposite end of the yard. The man straightway dashes after her. She comes back again with her head down, her wings out, and followed by an assortment of stovewood, fruit-cans, and coalclinkers, with a much puffing and very mad man in the rear.

Then she skims up on the stoop, and under the barn, and over a fence or two, and around the house, and back again to the coop, all the while talking as only an excited hen can talk, and all the while followed by things convenient for handling, and by a man whose coat is on the sawbuck, and whose hat is on the ground, and whose perspiration and profanity appear to have no limit. By this time the other hens have come out to take a hand in the debate and help dodge the missles—and then the man says every hen on the place shall be sold in the morning, and puts on his things and goes down the street, and the woman dons her hoops and has every one of those hens housed and contented in two minutes, and the only sound heard on the premises is the hammering by the eldest boy as he mends the broken pickets."

PROFITABLE POULTRY CULTURE.

J. L. Todd, before Cass County Farmers' Institute.

While a boy at home in old Ohio I can well remember the old Black Spanish rooster which I called my own, and showed with great pride to the neighborhood boys. Then came the old-fashioned Shanghi (Buff Cochin, we call them today), that had legs as long as a turkey, and could stand and eat corn off the end of a barrel. Those were wonderful chickens in those days, and many dozens of eggs have I carried to market in those days at five cents a dozen. But what a change from thirty-five and forty years ago! After coming west to Linn county, Iowa, and settling down in life, I procured some improved Buff Cochins. I wanted something better than the ordinary people had, and bought eggs at fifty cents apiece and raised seven chickens. When about four months of age I sold the seven chickens for the enormous sum of $7.00. Not so bad, was it, when you take into consideration that I had only purchased eight eggs?

That was my start in the fancy poultry business. Then I got Barred Plymouth Rocks, and I have never regretted it. For ten years I raised fancy chickens as a side issue, and finally branched out, left my trade, and started a poultry and fruit farm, and expect to continue same while I live. I find the fancy part of it most profitable, and can point you to hundreds, yes, thousands, of people in the middle west who are making good money out of it today. I can point you to five married women, all of them having families, and all living in the same county, that are making from $300 to $650 a year out of the fancy poultry business. Each one breeds but one kind of chickens and makes a specialty of that breed.

How do they do it, you ask? This is how they do. Each one has selected a different breed of the pure bred fowls. Of course they were to quite a little expense to get a start. Each tried to get the best she could procure. They selected such breeds as were profitable and in great demand. The first year they did not make a great amount of money, having raised only from forty to 150 chickens each. The first year I did not score to exceed forty birds for any one of them. The next year they had more scored, and for the last three years they have each been getting from 50 to 140 scored. Along at first they sold birds from 50 cents to $1.00 each, but each year they have been climbing up the ladder, step by step, until they now get from $10 to $50 a dozen, depending upon what the fowls score. One lady last year had an order for $40 worth of birds waiting to be scored the last of November. One of the other ladies told me this fall that she had sold over $300 worth of eggs for sitting this year. These are facts, my good friends, and I can name each one of these parties.

While there is fairly good money in a mongrel flock, there is three or four times the money in a well bred flock. Of course it takes more money to start with to get pure bred birds, but once you have the start, and manage it right, it will pay its way. You can not get something for nothing.

How can they dispose of their birds? This is the problem that confronts the new beginner. Advertise them, you say. Holy horrors, that costs money, too. Certainly. But that takes off the profit? Oh, no, my dear sir; that's a part of the business. This is only a small part of he expense. By judicious advertising you can sell a good bird for $3 to $5, and occasionally one for $10, while if you did not advertise you would be lucky to get $1. Of course, you could not afford to advertise just one bird, but the expense would not amount to more than 5 to 25 cents per bird where you have a lot of them. There are plenty of good poultry and farm papers, and a small advertisement in two or three of these papers will sell all you have, and you will be kicking yourself, or want somebody else to do it for you, for not raising more.

Don't be foolish and go headlong into the business and try to get every variety there is, nor run after the new varieties, but select just one good variety, mate the birds properly, and give the young stock the range of the farm. I am positive from experience that you can get better results and can raise better chickens on the farm. There is no place as good to raise chickens and children as on the farm. Look at a majority of our great men— they were raised on the farm. So it is with our highest scoring birds.

What is the best feed for hens, you ask? Plenty of good sound wheat, corn, clover, milk, and pure water, with some kind of good sharp grit and charcoal which, by the way, are not very easy to get, especially the last two named, in Iowa. Remember, fowls must be kept busy if you want them to pay their way, especially in the cold weather in January and February. Like boys, they must be kept busy, or they will get into mischief and then lose their appetites. It is the busy hen that lays the most eggs.

Farmers are far better situated to raise fancy poultry than are the city people and should be the ones to raise fancy birds. They have all the facilities for raising them and they should be the leaders in this business. It is only a question of time and education along this line when they will be the leaders and will be reaping the reward of their labor which justly belongs to the farmers.

REARING, FEEDING AND CARE OF CHICKENS.

Geo. D. Black, Greene County, Ohio, in Breeders' Gazette.

Chickens are a good deal like people. If you want a good strong chick that will grow fast, feather quickly, and never be an invalid, you should begin with its great grandparents. See that they are vigorous, and that their vitality is never allowed to be sapped by lice and unsanitary housing. Many a chick has come into the world like Richard the Third, "scarce half made up," and then peeped its unprofitable life away because of the sins committed against its ancestors by a heedless poultryman.

Virility is the foundation of a good flock. If one is aiming to keep pure-bred fowls other things are important, as form, breed type, and plumage; but if you are laying the foundation of a flock, sacrifice much else rather than begin with birds that are lacking in size and vigor. More disappointments have come in poultry-raising through the use of inferior breeding stock than in any other way. Healthy breeders mean strongly fertile eggs, and such eggs mean large hatches and rapidly growing chicks.

I believe most farmers will find it profitable to use incubators and brooders, It is pretty certain that the earl hatches are the best in every way. The chicks grow faster, they are much less exposed to the inroads of the various parasites that prey upon chicken life, they are ready to do much toward keeping themselves by mid-summer and are much better prepared than later hatches to enter upon the winter. If one is to have pullets to lay in the winter he must get his birds hatched early in the spring. But this can seldom be done with any degree of certainty when the hens are depended upon to do the hatching. One year I thought I would get the most of my hatching done in March and early in April, and so avoid the diseases and troubles that are apt to visit the later broods. But my hens (Langshans, too, at that) utterly refused to fall in with my plan. They laid excellently well, but sit they would not till they got a good ready, and they did not sit till late in April. That spring's experience converted me to the incubator. Wtih an incubator you can get your chicks out as early as you please. Some of the best broods I have ever raised were hatched so early that sometimes the brooder which sat out in the yard would be nearly buried in snow. The incubator is much more satisfactory than hens in every way. When one gets the hang of it it is easy to operate, and there is no bothering with refractory hens that stay off their eggs too long, or that tramp the newly hatched chicks to death. Then too there is considerable saving in being able to keep all the hens at work laying. Hatching and brooding chicks means the use of 14 or 15 hens that would be able to lay enough eggs to pay for the running of several incubators and brooders.

And there is just as much advantage in the brooder as there is in the incubator. A good one does its work thoroughly. It is free of lice. It is always there ready to brood the little fellows. There is no hen there to annoy you or to tramp over the feed and scratch it in every direction. If the weather is bad the brood can be kept indoors and will be as comfortable is if it were in a cellar. My brooders are so well supplied with windows that they are thoroughly lighted and the chicks get the benefit of every ray of sunlight.

One counsel I would give in regard to brooders is that in buying or making them (and if you are skilful with tools you can make a good brooder) see that they are large enough. It is not wise ever to put more than 100 chicks together. It is better to have the number smaller than that. The little fellows need room to stir around in, and they never thrive their best when they are crowded. The brooder that is the most satisfactory is the one that has two compartments, one with the hover in it and the other to be used as a feeding-room. This sort is more easily kept clean and it is more sanitary. The feeding-room should have plenty of glass in it. A glass top is preferable. The chicks like to bath in the sunlight and it is a wonderful promoter of health and growth in the brood.

If the hatching and brooding are to be done with hens it will be found a good arrangement to have a room set apart for the use of the sitting hens. I find it necessary to use a few hens each season for hatching, and I fix up a corn bin in the granary for the purpose. It is closed up with a horse blanket so as to confine the hens to the room. It is large enough to accommodate 15 and give them room for feeding and for dusting themselves. Boxes are provided that are just large enough to admit one hen in each, and that are low enough to allow the hen to step into the box without being compelled to jump down on to the eggs. When I want a clutch of eggs brooded I put the eggs in one of the boxes, bring a broody hen from one of the laying houses and carefully put her on the eggs. I select one that gives signs of being a resolute sitter, and I rarely fail to get her to settle down to business. It is best usually to set three of four at a time, so that if some of them have poor hatches the chicks can be given to the other hens. A Plymouth Rock or Langshan can brood from 12 to 15 chicks.

This sitting-hen is provided with water. grit, and a dust box. A record is kept of the dates of the setting of the hens, and as soon as one begins to hatch the chicks are taken from under her and put in a basket lined with some soft cloth and placed near a warm stove. In this way every chick is saved—none are trampled to death by the hen. When the hatch is over the brood is put with the hen in a dry place and they are given water and fine grit. Nothing is fed them for from 30 to 40 hours. Two days is probably not too long a fast for them.

This plan I have found to be the best of any I have tried. In this way the sitting hens are separated from the rest of the flock, they are not disturbed by other hens, they are not inclined to remain off the eggs too long, and they are more easily cared for.

Usually the method of allowing the hen to run with her brood is not satisfactory. The loss from storms is pretty sure to be heavy. Of course a hen will hunt a great deal of food for her young if she is given free range. On the whole, though, I find it best to keep the hens confined most of the time in comfortable coops. These should be roomy and rain-proof, and if they are without floors they should be moved so as to secure cleanliness for the hen, and her brood.

Another thing that needs to be attended to with scrupulous watchfulness is the dusting of the hens with some good insect powder. Pyrethrum I have found to be thoroughly satisfactory for this purpose. There is no other such source of loss in the poultry yard as that from lice. One fatal lapse of care in this respect may spoil a summer's work. The poultryman must settle it with himself once for all that eternal vigilance is the price of a healthy, vigorous young flock. Dust the brooding hens with your insect powder at least once in two weeks. Do it thoroughly. Use an insect powder bellows that will blow the powder down to the skin and all through the feathers. Look out for head lice. These are the most destructive of all kinds that infest poultry, and they are the hardest to get rid of. I could a tale unfold in regard to these pests. Last summer in my absence from home for two weeks they started in on one of my young white Langshan flocks, and when I returned more than a dozen pullets were nearly ruined by their ravages. Nothing short of dipping this entire flock in an insecticide was sufficient to destroy them. Again I say watch out for head lice. They will get in their work when you least suspect.

The red mites are not found on the boides of the hens and their broods, but in the cracks and hiding places of the coops, from which they sally forth at night and prey upon the fowls. It is easy to get rid of them and to keep rid of them. Kerosene is quick death to them and can easily be applied with an oil can such as is used around farm machinery. There is no reason why any poultryman should be seriously troubled with red mites.

HOW TO RAISE TURKEYS ON THE FARM.

C. E. Matterson of Pewaukee, Wis., Gives his Experience in Breeding and Caring for Young Poults in Twentieth Century Farmer.

Raising turkeys is purely an American industry and dates back to the first discoveries of America. The Cabbot brothers, under King Henry VII, sailing from Bristol, England, in the year 1497, discovered a portion of this country. Upon their return to their native country they took with them three Indians and two turkeys. These, the first turkeys ever seen in Europe, must certainly have excited a great deal of curiosity.

It is very important that we have good, strong, vigorous, breeding stock, selecting the females from our earliest hatches. Be sure and get those that have always been free from disease and whose ancestors have, likewise, for if we start with diseased stock we may rest assured the same weakness will show in our young stock afterward. Then in selecting the male be sure to get one that is not related in any way for we cannot even interbreed with turkeys. I do not like a great big overgrown bird, but one of medium size, with well rounded body, broad and deep through the breast, which means good, strong vital organs. Being half the flock he is sure to transmit this vigor to his get.

A great mistake that a large majority of our farmers make in selecting their breeding stock is that they generally have some small, inferior, late-hatched stock, and being a little greedy for money, a fault we all have, we are almost sure to sell off our largest and best birds, keeping the late hatched, inferior stock for our breeding stock the coming season. This means that we are going to have weak stock all the way through.

EGGS FOR HATCHING.

Now, assuming that we have good, strong stock to begin with, let us see that we do not get them too fat during the winter season. In fact, I will say that we want them to come through in the spring in a rather thin condition, commencing to feed them up a little about March 1, so as to get them to laying about the first day of April or the last of March.

Accumulating the eggs at this season of the year is not a little concern to the most of us, for the weather is usually a little chilly and the turkey hen is rather shy and sometimes is given to wandering quite a distance. To obviate this difficulty I have simply wired off my small barnyard, keeping them all in every morning until they have depoisted their eggs in their barrel nests that I have arranged around the outside of the interior of the yard. This is usually about 10 o'clock After that they are given liberty for the rest of the day, but after they have commenced laying in a particular nest it is not necessary to yard them, as they will always take to the same nest. But should any of them get the best of you and steal her nest, just catch her after she has gone on her perch at night and keep her closed up the next day until about 9 o'clock. When you let her out pull off yaur hat, coat and vest and prepare yourself for a chase, for she is going to cut right across lots, straight to her nest, and unless you are somewhat of a lean, lanky fellow she is going to get there before you do.

HOW TO SECURE UNIFORMITY.

No matter how the hatching is to be done, whether by hens or machinery, be sure and make a wholesale job of it. This practice that a great many have of setting a hen as soon as they have accumulated eight or nine eggs, doing the same thing again in three or four days, is certainly a great mistake. You will see that by this practice you have your young poults of all ages and sizes, which means that you have to have two or three varieties of feed around, and it also means that the larger one are going to trample on and rob the smaller ones. But the worst feature of it is when you come to market in the fall you will have a very inferior lot of uneven turkeys to sell, and will probably have to take from 1 to 3 cents per pound less than you would if you had saved up the eggs as fast as they were laid, keeping them in a temperature of about 60 degrees and turned them half over every other day until about May 1. At this time our turkey hens have nearly all finished laying their first clutch. These hens are put right to work doing the same thing over again, for I consider a turkey hen's time too valuable to spend sitting on eggs at this season of the year, so my hatching is done in incubators, and after hatching the young poults are all given to turkey hens, for I consider this the only profitable way to rear turkeys. All farms are teeming with animal life, nature's food, so to speak, and where they are given to the turkey hen to raise they take a range outside of what our common fowl do, which is just the condition we are after.

CARE OF YOUNG POULTS.

Where hatching is done with machines a great loss sometimes occurs through their getting chilled, for not knowing the call of the turkey hen they are liable to wander away from the rest of the brood. My method is to leave them in the machine until they are good and strong—say about thirty-six to forty-eight hours after the hatch is all done—and supposing of course, that your turkey hen has been sitting for at least four days. Then the little ones are placed in a comfortable box or basket and are carried and placed under the turkey hen just about sundown. Before morning they will take kindly to their new stepmother. Then about 9 or 10 o'clock the next morning the young stock are again placed in their comfortable basket, and at this time each little poult is marked in the web between its toes so that we are able to claim our own should they ever mingle with our neighbor's turkeys. Then, with the turkey hen, they are taken to a little three-cornered pen some ten or twelve rods from our building which is to serve as a home for them for the next five or six days. This pen is simply three pieces of 1x12 feet long, nailed together at each end, forming a three-cornered pen. The young poults are confined in these pens until their wings have grown out slightly and have folded in close to their body and the red has shot out on the head and neck. After that we can safely liberate them to the tender care of the mother turkey.

THE HEN TURKEY.

I omitted to say that as a general rule, when placing a brood in these three-cornered pens the turkey hen is given her liberty but sometimes she is a little uneasy. In that case it is better to coop her in a slatted coops so that she can see out from either side. The reason I prefer this style of coop is that a turkey is of a wild Indian nature, and if we let her know that she is confined it arouses that wild nature and she will not brood her young as faithfully as she otherwise would do. And right here let me say that while these poults are confined in these pens it is very important that they be taught some kind of a call. It matters not just what this call is, so that we establish it. It serves to call them home at any time you choose. To establish this call commence when you first feed them, calling slightly at first every time you feed. They soon get used to that call and know that it means something to eat, and ever after when they hear it they will cut pell mell cross lots to get their share of the food. I would like to say still further that after they are let out of their little pens they are never fed but once a day, at night, unless it should be a cold, wet morning. Then I always get to the mvery early in the morning with a dish of warm feed. This serves to keep them from rambling as much as they otherwise would until after the dew has disappeared and the weather has warmed up a little.

WATER FOR YOUNG TURKEYS.

Young turkeys should always have a fresh supply of water from the start and it should be given in such a way that they cannot get into it and get wet. I use little automatic fountains, made of galvanized iron. After they are given their liberty be sure to see that his supply of water never runs short, it will aid you in getting them home nights. Right beside this water dish be sure to have plenty of fine, sharp grit and a dish of charcoal. Be sure that these three articles never run short; they will not be healthy without them.

After they are from six to eight weeks old they are ready to take to some kind of perch. We generally let them have their own way about this for awhile, but just as soon as they have all taken to their perch nicely they are all driven together to what I call the turkey tree. I like to have them all together at night; it is so much easier to protect them from their numerous nocturnal enemies.

FINISHING FOR MARKET.

Now, as to getting them ready for the market. I commence to feed them up in the fall, just as soon as nature's food commences to disappear, which is generally about the middle of September, after the frost has killed off all insects. I first commence with one part wheat shorts, one part wheat bran, and two parts corn meal, using whatever small potatoes we have to spare. This soft feed is fed morning and at noon, giving them only what they will eat up quickly and clean. Then the last thing at night I give a full feed of either corn or barley, allowing an occasional feed of whole oats, being careful not to use too many oats. Later on, about two or three weeks before they go to the market, they are getting all of the corn they will eat up quickly and clean, three times a day, with an occasional feed of the same mash as formulated above.

SUCCESS WITH TURKEYS.

H. A. NOURSE, ASSOCIATE EDITOR RELIABLE POULTRY JOURNAL.

The nature of the range on which they run in August is an important agent in producing satisfactory growth and development in young turkeys and preserving the health of old ones. In spring and early summer the well drained uplands are more healthful and offer more nourishment to be secured by the foraging flock, but in August more confort and food is found in the meadows and swamps and well shaded tracts. The flock will now spend the early hours of the day pursuing grasshoppers and other animal food on the high land, but when the sun is well up they will retreat to shaded places and spend the greater part of the day there. A well wooded swamp offers more comfort and provides a greater amount of food, both vegetable and animal, than can be found anywhere else in midsummer. The moist earth and decaying wood yield a rich supply of worms, bugs and insects and tender roots and other fresh vegetable growths take the place of the new blades of grass that the turkeys gather on the mowing pasture lands earlier in the season. On farms where there is no low, swampy territory an orchard of full grown trees furnishes the best substitute. The trees will provide shade, under which there is likely to be more or less fresh green food, even when the hills are parched and brown, and the turkeys will render valuable service by destroying animal life that preys on the trees and fruit. Do not confine the flock in an orchard, or any other plot of limited area, at this time of year, but let them have their liberty and they will make the most of every opportunity, thereby reducing the cost of keeping them and increasing the rapidity of their growth and development.

GOOD WATER ESSENTIAL.

A supply of good, fresh water is no less necessary than sufficient nourishment. A clear, rapidly running brook that is easily accessible solves the drink supply problem in a manner satisfactory to turkeys and owner. Stagnant pools should not be depended upon. The flock will drink at such places if no other supply is at hand, but fresh water given morning and evening in clean utensils, from which old and young can conveniently drink, will lesson and sometimes entirely prevent the habit. It is safe to remember that turkeys cannot obtain a satisfying drink from some of the fountains used for smaller fowls. A turkey's beak is several times as large as that of the ordinary fowl and it must be well immersed, or the bird cannot take water easily. There is nothing much better for the purpose than a wooden pail, from which two staves have been cut off half way down the side, and on which a cover is placed to keep out the dirt. This, if placed in the shade, will keep water cool and clean. If the turkeys come in frequently for water the pail should be refilled at least three times a day.

SITTERS ON INFERTILE EGGS.

Summer turkeys eggs are less fertile than those laid earlier in the season and occasionally a hen will lay a nest full of infertile eggs in a secluded place and sit on them until fall, if not discovered. Sometimes one will die on the nest of such eggs, while others will sit until driven from the nest by cold weather. The latter do not molt while sitting but become very thin in flesh. They then begin to molt at the beginning of cold weather and are frequently ruined for sale purposes and incapacitated for breeding if, indeed, they all survive. It is, therefore economy to make sure that none of the older turkeys remain unaccounted for after the middle of the summer.

CARE OF THE OLD STOCK.

After the breeding season it is customary to pay but little attention to the old stock during the summer. This is a convenient and safe method when all the members of the flock obtain all, or a good part, of their food by foraging in the fields, for the exercise they take in so doing and the nature of the food obtained prevents them from taking on too much fat. The greatest menace to a turkey's health and usefulness as a breeder after the first year is fat, and a specimen that becomes overfat is never as valuable again.

The warm weather inclines those of the old birds which have no broods to remain quiet, in the shade, the greater part of the day, if they can secure sufficient food without hunting for it. Old toms are particulary averse to any form of exertion at this season. If these turkeys are fed liberally, or are allowed to eat with the farm yard flock of smaller fowls, they almost without exception will become too fat and much loss without apparent cause will result. On this account the flock should be offered every inducement to find most of their food on the range. If fed regularly the ration should be given late in the afternoon and no opportunity allowed to get food during the day, except that obtained in the fields. If the supplied ration is only sufficient, when added to the food secured by foraging, to properly nourish the body and is not sufficient in quantity or composition to put on fat, externally or internally, the good health of the flock will be maintained.

RECENT EXPERIMENTS IN FEEDING DUCKS.

U. S. DEPT. OF AGRICULTURE BULLETIN.

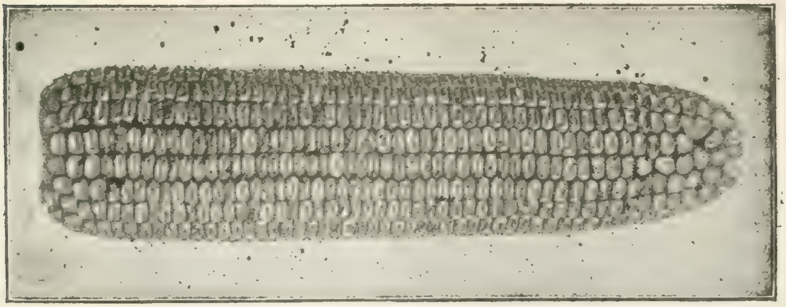
The feeding and management of poultry has been studied by a number of the stations. In most cases the work has been confined to chickens, although some noteworthy investigation have been conducted with geese. Quite recently three of the stations have reported experiment with ducks.

The Michigan Station studied the comparative growth made by 39 young ducks and the same number of chickens on similar rations. The ducks were two weeks old at the beginning of the test and were fed middlings, corn, and bran, together with the necessary grit and green food (lettuce), and were given the run of a small yard with a grass patch. The chickens were fed bran and relatively more corn meal than the ducks, but had no middlings. They were also given lettuce and allowed the run of a grass plat. Both chickens and ducks were given skim milk in addition to the other food. At the beginning of the test the ducks weighed 13.25 pounds and the chickens 7.5 pounds. In five weeks the ducks were nearly ready for the early market and had gained 108.75 pounds. They had eaten 41.3 pounds of corn, 93.1 pounds of middlings, 43.4 pounds of bran, 59 pounds of lettuce, and 88 pounds of skim milk. The total cost of a pound of gain was 1.9 cents. In the same period the chickens had gained 22.5 pounds and had consumed 52.2 pounds of corn, 25.9 pounds of bran, 46 pounds of lettuce, and 44.3 pounds of skim milk. The total cost of a pound of gain was 4.84 cents. In discussing the profit corn and bran are rated at $14 and middlings at $15 per ton, milk at 20 cents per hundred, and lettuce at 1 cent per pound. The ducks gained much more rapidly than the chickens and the gains were more economically made. The chickens were not large enough for market at the close of the test and the feeding was continued for some time before they were sold.

At the North Carolina Station 18 Pekin ducks were fed for fifty-six days from the time they were hatched. At the beginning of the test the total food consisted of 4.4 ounces of corn meal and an equal amount of bran per head daily, while at the close of the test, 6 pounds 10 ounces of meal, 4 pounds 3 ounces of bran, and 3 pounds 5 ounces of bone were fed daily. In addition to the grain an amount of fine grit equal to one-sixth of the weight of the grain, and chopped green clover equal to one-fourth the bulk of the ration were also fed. All the feed was mixed with water to a crumbly mass and fed in troughs. No water was allowed expect for drinking purposes. In this test corn meal, cut bone, and grit were each rated at 1 cent per pound and wheat bran at 0.9 cent per pound. Account was also taken of the value of the clover fed, the eggs set, and the food of hens carrying the ducks. The ducks weighed 2 ounces when hatched, and 4 pounds 15½ ounces at the close of the test. The cost of a pound of gain was 5.05 cents; that is, the ducks cost on an average 25 cents to fatten and were sold for 50 cents each.

Experiments at the New York State Station already noted in this series of bulletins showed that ducks did not thrive and make rapid growth unless they were fed a considerable amount of animal matter, the most rapid and economical gains being made when from 40 to 50 per cent of the protein of the ration was supplied in the form of animal matter.

The above experiments were made for different purposes, but the inference may be fairly drawn from all that ducks can be profitably fattened under proper conditions. The standard breeds of ducks have been described, and the feeding, management, and marketing of ducks discussed at length in a recent bulletin of this Department.—C. F. LANGWORTHY.



E---Regarding Corn.

IOWA, THE CORN QUEEN.

An angel came to earth one day,
  And, seeking every state,
To each he gave a little gift
  Of value small or great.
An ore, a mineral, or a gem,
  With colors like the morn;
To Iowa he only gave
  A single grain of corn.

But while her sister states displayed
  Their gold or silver bright,
Their lumps of lead, or copper red,
  Or coal as black as night,
She plowed her fertile acres up,
  And in the mellow mold
She planted in the balmy spring
  Her seed of living gold.

It sprouted in the crystal rain
  And ripened in the sun;
It gave her back a million grains
  Where she had sown but one,
It cleared away the tangled wood,
  And turned the idle wheel.
And swelled the seas of commerce high
  With streams of yellow meal.

A mighty state is Iowa,
  Her fame has traveled far;
No fairer lands than hers are seen
  Beneath the western star.
And, source of all her wealth and power,
  Upon her shield is borne,
Below the eagle and the scroll,
  A sheaf of golden corn.

—Minna Irving, in Leslie's Weekly.

USES OF CORN

FROM PENNSYLVANIA BULLETIN 133, BY

DEWITT C. WING.

Corn is now used in the manufacture of a large variety of products. The grain, cob, husks, stalks and leaves are each devoted to some useful purpose. The following is a list, complete so far as the writer is aware, of the products now being made from corn without the use of any other component material. The number of articles of commerce that are now made from corn has reached twenty-nine. Glucose sugar refining companies alone manufacture this number of products, and the number of bushels of corn consumed annually by these factories in the United States reaches far into the millions. Smokeless powder, which has come into extensive use, is manufactured by the aid of distilled spirits made from corn. The list is as follows.

Mixing glucose, of three kinds, used by refiners of table sirups, brewers, leather manufacturers, jelly-makers, fruit preservers and apothecaries.

Crystal glucose of four kinds, used by manufacturing confectioners.

Grape sugar, of two kinds, used by brewers principally, and also by tanners.

Anhydrous sugar, used by ale and beer brewers and apothecaries.

Pearl starch, used by cotton and paper mills.

Powdered starch, used principally by baking powder manufacturers and also by cotton and paper mills.

Refined grits, used in place of brewings' grits, and give better satisfaction.

Flourine, used by mixers of flour without detriment, except as to the feeling that a corn product is taking the place of a wheat product.

Four kinds of dextrine, used by the fine fabric-makers, paper box makers, mucilage and glue makers. apothecaries and many industries requiring a strong adhesive agent.

Corn oil, used by table oil mixers, lubricating oil mixers, manufacturers of fiber, shade cloth manufacturers, paint manufacturers, and in many similar industries where vegetable oils are employed.

Corn oil cake, gluten feed, chop feed and gluten meal, all cattle feeding stuffs of a high grade.

Rubber substitute, a substitute for crude rubber, and very extensively used.

Corn germ, the material from which the oil and cake are obtained.

British gum, a starch which makes a very adhesive medium and is used by textile mills for running their colors, as well as by manufacturers who require a very strong adhesive which contains no acid.

Granulated gum, which competes with gum arabic, is used successfully in its place and finds ready preference by reason of the absence of any offensive odor.

Of course one of the principal uses of the grain is that made of it by distillers in the manufacture of alcoholic liquors. Large quantities of corn oil are used in the manufacture of soft soap in foreign countries. It also is used as an adulterant of olive oil. Pure corn oil is generally regarded as superior to the ordinary olive oil.

Fiber is manufactured from the shell or outer portion of the stalk, while the inner portion, or pith, is ground and made into a product called cellulose, which is used in packing the coffer dams of warships. Pyroxline varnish is also made from the shell of the stalk. The other portions of the stalk and the leaves are ground and prepared for stock and poultry feed. The husks are utilized in the manufacture of mattresses. The cobs are turned into cob pipes, and by the process of fermentation vinegar also is made from the cobs.

It is unfortunate that farmers as a rule do not make more thorough use of the corn plant on the farms. More than one-third of its value is allowed to go to waste on many farms where the stalks are burned.

CULTIVATION OF CORN.

Mrs. F. C. Furbush, Walker, Iowa, before Linn County Farmers' Institute.

"Corn is King, and he who would be a Prince of the Realm must cultivate it most scientifically.

The remorseless scythe of Father Time has at last winnowed another century and trailed its eventful record across the plains of eternity. He has garnered from it a marvelous harvest of noble deeds, illustrious names and wonderful scientific inventions for our benefit. He recorded greater progress in every avenue of human activity during the nineteenth century than in all others combined. Yet with all this wealth of achievement at command and with all the improvements that have been accomplished, we are still dependent upon the farmer for the necessities of life. He still feeds and clothes the multitudes as in the day of the Pharaohs, and his rank amoung men yet remains as Washington recognized it—"The most healthful, the most useful, and the most honorable employment of man."

Secretary of Agriculture Wilson says: "We have reached an era in which the farmer of the Mississippi Valley is decidedly to the front. Never before was he so prosperous, and I am convinced his prosperity is not ephemeral." He contributes a crop of wheat every year that exceeds the annual output of all the gold and silver mines of this country —his yield of oats quite equals the value of our coal and copper mines; and his annual contribution of corn is worth more in the markets of the world than the combined annual output of all the mines of the United States. But this is only a tithe of which he contributes toward the welfare of humanity; for the same force that brought Putnam from the plow, Jefferson from the plantation, and Webster from the field is still at work. He still continues to contribute the best brain and brawn of our modern life. The profits which accrue to the farmer must come from two sources—good prices and abundant crops. Over the first he has, unfortunately little control, while over the latter he often has more influence than he realizes. So far as corn is concerned, however, he has but little to gain by experimenting with new and wonderous varieties of seed, for the standard varieties are well kknown and universally planted. Nor can he reasonably expect any increased profits by adopting new methods of harvesting. Therefore he must seek for greater returns from his corn field in improved methods of cultivation. This can be done only by adopting the most improved and scientific principles. "As ye sow so shall ye reap," has been transformed by modern scientific research into "as ye cultivate so shall ye harvest." To what extent water is essential in the growing processes of both plants and animals is probably the range of knowledge of all except the scientist especially interested in this phase of life. In general, however, we know that plants cannot thrive without sufficient moisture any more than stock can live without an abundance of good water. Plants, like animals, require their food in liquid form; but unlike animals have no complex digestive apparatus, they are compelled to send a multitude of roots and rootlets into the soil to seek proper food wherever it may be dissolved in water. They are alike, however, in that they use large quantities of water to carry nutriment to the growing parts and to remove the refuse that accumulates in the cell building process. The plant requires more moisture to dissolve its food, hence must dispose of more moisture than the animal in its growing processes. It disposes of this waste-bearing water through the pores of its leaves. Thus a curent of water from the roots to the leaves is constantly moving during the life of the plant. Removing the leaves, severing the stalk or cutting the roots stops the current and kills the plant. How this vast quantity of water can be collected has much to do with the sort of cultivation the corn requires. Prof. King of the Wisconsin State university has proven in a series of scientific experiments that in this temperate climate an acre of corn will discharge through its leaves during a season 1191 tons of water.

Careful investigation in the field will prove to any candid observer that corn has no tap roots as is often claimed. When the seed sprouts a very fibrous and short lived root is thrown out directly from the young sprout. About the time the blade reaches the atmosphere the next set of roots make their appearance. They are thrown out just above the seed and are in a whorl containing from three to ten rootlets. When the plant is ready to "shoot" the soil to a depth of several inches is completely filled with these roots and there numerous branches within a radius of three to eight feet of the stalk. These moisture colecting tubes must do their work near the surface so as to secure food of the proper temperature, hence their course is nearly parallel with the surface of the ground instead of downward as is generally supposed. Continued cold weather will cause them to grow toward the surface while excessive heat will send them deeper into the earth. These fibrous roots are the sole support of the growing plant. They supply it with food dissolved in soil moisture and hold it in its erect position until the ear appears. The stalk now becomes too heavy and the brace roots make their appearance. These penetrate the earth to a depth of several feet and have led to many mistaken ideas in regard to cultivation of corn. They appar too late in the season to be aided or injured by any system of corn culture and play no important part in its cultivation.

The first practical investigation of the root growth of corn was made by Mr. J. D. Tower of Mendota, Illinois, more than thirty years ago, when he conclusively proved that corn that was three to four inches high had a whorl of roots five to eighteen inches in length, lying within a few inches of the surface. Subsequent investigation made in all varieties of soils and at all the stages of the growth during the cultivating season have as conclusively proven:

That the roots extend across the row long before the corn is laid by.

That the length of the roots greatly exceed the height of the stalk during the cultivating season.

That the whorls of roots spring from the stalk within two inches of the surface.

That they seldom penetrate the soil below the furrow slice until corn is in the silk.

That the usual method of corn cultivation with shovel-plows is very destructive to the feeding roots.

Prof. Kapp of the agricultural college and Prof. W. M. Hayes of the university of Minnesota, made an investigation and stated that with corn planted May 19, one week later, May 26, the stalks were found to be one inch high and the roots average eight inches long. June 2 the stalks were three and one-half inches and roots were nearly eighteen inches. On the 9th, the stalks were eight and one-half inches and the roots two feet. Up to this time the roots had sought their food near the surface none of them having penetrated the soil to the bottom of the furrow slice. With but a few exceptions they were near enough the surface during almost their entire length to be mangled and broken by the shovel-plow.

On the farms in this section of the country it is no uncommon sight to see a man driving the cows out of the cornfield lest a few leaves be destroyed and he will immediately return to his task of butchering the roots by the thousands with the shovel-plow in the honest belief that he is cultivating corn. Instead of promoting the conditions that will assist the crop to grow, he not only destroys them but mutilates the work that Mother Nature has already done. Not only must the soil moisture containing plant food be brought near the surface to be warmed and purified by the sun, but it must be retained there so that it will be available for the young plant. It is a very well known fact that a lumpy field will dry out much more quickly than a well pulverized one. There is nothing to retain the evaporation in the soil moisture in the former, while the latter is able to retain its moisture by the protecting layer of fine soil. Harrowing, planking, rolling and pulverizing are designed to crush the lumps, close the large air spaces and cover the plowed fields with a blanket of fine earth so that wasteful evaporations may be prevented as far as possible. The important work of preparing the surface for planting has been (and is in some localities to-day) carried on after the manner of our fore-fathers until recent years when Mr. Tower devised and perfected his justly celebrated pulverizer.

The cultivation of corn is primarily designed to kill the weeds that rob it of its food supply and occupy the space it needs for the spread of its leaves to the heat and light of the sun. There is another side to corn culture than that of weed killing, and of quite as much imporatnce It is that of preserving the food supply dissolved in soil moisture near the surface. Plowing and pulverizing are the processes by which this food is collected and retained until the young corn can utilize it. Therefore the method of corn culture must provide not only for the destruction of the weeds but must restore the blanket of finely pulverized soil to prevent the escape of the soil moisture without disturbing or dstroying the roots of the growing plant. It seems impossible that any one who is acquainted with plant growth and knows that it is most perfect when provided with an abundance of food should doubt the superiority of the shallow cultivation over deep cultivation. The various agricultural experiment stations in the corn producing states have investigated this phase of corn raising more carefully and persistently than any other, and for the benefit of those unacquainted with the results of their tests. I will read a few reports from the agricultural experiment station, of Champaign, Illinois:

Deep cultivation 59 bu. per acre.

Shallow cultivation 69 bu. per acre.

Indiana experiment station at Purdue, Indiana:

Experiments with deep and shallow cultivation show that in the average yield for five years and the gain of 13.6 per cent in shallow cultivation.

An experiment comparing deep and shallow cultivation of corn in the state of Iowa during two years gives the following table:

Shallow cultivation 72 bu. and 92.7 bu., an average for the two years of 82.4 bu. per acre.

Deep cultivation 69 bu. and 89.1 bu., an average for the two years of 79.1 bu. per acre.

The difference in the result of deep and shallow cultivation for corn is fully equal to the difference between a poor crop and a good one.

GROWING PRIZE-WINNING CORN.

J. H. Thrash, Champaign County, Illinois, in Breeders' Gazette.

The 25 ears of show corn illustrated in the accompanying engraving I recently sold for exhibition purposes for $150 cash. This corn is a true type of the Farmer's Interest variety, a pure white corn that is noted for its deep grain and fine ears. The price of a bushel of corn at the price these 25 ears brought would be $388.89.

This sample of corn was selected out of 40 acres by going through the field with a sack, taking two rows at a time and looking at every ear that looked as if it were the type I was looking for. These ears then were taken to a place in which there was no danger of them getting damaged in any way, and when I had finished going through the field in this way I then had several hundred choice ears of very fine quality. I then layed them out so I could easily see them all and then I began my last selection for the 25 ears in the photo. I was almost a week in selecting this sample after they were all gathered from the field. The seed I used to plant this field was selected the fall before as the corn was being husked and put in a place to dry. The ears of this seed were about two-thirds capped entirely over the tips and were filled at the butts, having very little space between the rows. All were carefully looked at and tested long before planting time. They were shelled by hand for planting.

This corn was panted, butts, tips, and all, without shelling off at either end. It is being bred to get as much oil as possible and to get a very heavy, solid ear of medium size.

The soil in which this corn was grown was low black ground and clover sod plowed in the spring about 4½ inches deep with a 12-inch gang plow. About May 5 I began preparing the seed-bed. I first disked it with a solid-wheel disc and then harrowed it twice with a four-horse slanting tooth harrow; on May 9 to 13 I planted the corn with an edge drop planter, using a three-grain medium drop 3½ feet both ways. As soon as the corn was planted I harrowed it with a slanting-tooth harrow and again harrowed it just as it began to peep through the ground, and when the corn was large enough to work it was cultivated three times with a surface cultivator. It was laid by the last of June, when the corn was almost three feet high. This corn grew very rapidly and was out of the way of frost September 10. I began husking it the latter part of October. This corn was very dry and solid and yielded about 75 bushels per acre.

SHRINKAGE OF CORN.

Extracts from Quarterly Report of Kansas State Board of Agriculture.

The cost of carrying ear corn one year or longer is probably greater than many people figure it. "For instance, the cost of 1000 bushels of corn at 21 cents is $210; interest at 7 per cent for one year, $14.70; expense of crib, $20; cost of the corn at the end of one year, $244.70. But it is estimated that the shrinkage will amount to 20 per cent., or 200 bushels; therefore, there will remain but 800 bushels to sell. So $244.70 actually represents the cost of 800 bushels at the end of one year, or a fraction over 30 cents a bushel, without figuring anything for insurance or risk in holding, showing that 21 cents at gathering time is equal to about 30 cents a bushel one year later."

The following is from the *Journal of Agriculture*:

In 1893 a farmers' club in Pennsylvania adopted a resolution asking the members to make a test and find out by actual weight how much corn would shrink or lose in weight from husking-time until the next June 1. In accordance with that resolution, ten farmers reported the shrinkage from November 1 to February 1 as 8 2-3 per cent., and the shrinkage from February 1 to June 1 as 7 2-3 per cent., or, from husking-time to June 1 next, 16 1-3 per cent. In the above test each farmer took a double bushel of corn ears and kept them separate, weighing the same corn on the first of each month from November 1 to June 1, inclusive. Members of the same club in 1894 made another trial, and, instead of taking a double bushel of corn ears, each man was to weigh 70 pounds of corn ears at husking-time, about November, and then weigh the same corn again on February 1 and June 1. Fourteen farmers reported the shrinkage from November 1 to February 1 as 7.6 per cent., and the shrinkage from February 1 to June 1 as 8.9 per cent., or, from husking-time to June 1 next, 16.5 per cent. To those farmers who sell their corn instead of feeding to stock this information is valuable. However, shrinking is not the only loss in holding corn over. The mice and rats waste a great deal, and sometimes, through improper care, some of it gets wet and spoils. Besides, if sold at gathering-time at a good price, the farmer can have the use of the money at once.

An Ohio farmer tested a crib of corn as follows: The first load was cribbed October 9 and the last October 22. The total quantity cribbed was 34,970 pounds. The first load was hauled out January 8 and the last February 1. The total hauled out was 29,995 pounds, showing a shrinkage in the process of seasoning of 4995 pounds, or 14 per cent. This is new light on the shrinkage of good corn in prime condition. The popular rule for estimating shrinkage has, heretofore, placed the loss by this process at 7 to 8 per cent. for all grades.

"Of the various crops, corn is perhaps the one in which shrinkage during storing is the most apparent, owing to the moisture content of the ears at harvest-time. During the time that corn is stored in the crib the shrinkage is greatest. Weights taken weekly during an entire year on some 7000 pounds stored in a crib built on the platform of a scale showed some variations due to weather. The shrinkage during the year was 9 per cent. of the original weight for the first three months, 5 4-7 per cent. for the second, 3 1-7 per cent. for the third, and 2 5-7 per cent. for the last three months. The loss for the entire year amounted to 1,430 pounds, or a little more than 20 per cent. In another test, where the corn used was in a much drier condition and the rainfall for the season was less, the total shrinkage for the year was 9 2-7 per cent."

"Corn shrinks more than any other grain. Experiments have shown that corn when in a condition to crib dries considerably through the winter. A thousand pounds will shrink 115, or 11 1-2 per cent. This shrinkage, with the interest on the investment for six months, would make corn that is worth 50 cents when cribbed worth 60 cents next spring, to say nothing of waste and extra handling, which in many instances is as much or more. A knowledge of these facts causes the thoughtful corn grower to hasten the sale of the new crop before it is thoroughly dried, for there is not often reason to expect a 10 or 12 per cent increase in price by keeping it, nor do they expect consumers to pay that amount more for corn a year old than they would obtain new corn for. If you determine to sell your crop, let it go as soon as the buyer will take it."

According to information collected by the Missouri Agricultural College, the farmer who puts his corn in a crib to hold it for better prices can count on a loss by the next June of at least fifteen per cent.; that is to say, leaving out of account the cost of handling and loss by waste, 30 cents a bushel for the crop at gathering-time is better than 35 cents the next spring.

COST OF PRODUCING A BUSHEL OF CORN IN MADISON COUNTY.

Ernest Mueller, before Madison County Farmers' Institute.

The question of producing a bushel of corn is often overlooked by the average farmer.

The cost varies with the amount of labor put upon an acre of land in an indirect ratio. It is understood that no farmer will put so much labor in his cornfield as to cause diminishing of returns.

Since labor is the chief factor in the cost of producing a bushel of corn it will be well to figure from that basis. From observations and experience it can be closely estimated what a team and man can do in a day and what the cost will be. Rent of land can be figured in the neighborhood of $4.00 per acre.

To get close estimates it will be necessary to follow the routine of raising corn. If the land has been in corn the previous year the stalks must be disposed of. A man with a three horse harrow can cover forty acres in a day, and going over it twice would cost 20 cents per acre. Raking twelve acres per day would cost 30 cents per acre. Discing before plowing 35 cents per acre. Plowing $1.25 per acre. On an average one half of the plowed land must he disced before planting, at a cost of 15 cents per acre. Harrowing twice, 25 cents per acre. Seed corn 15 cents per acre. Planting 25 cents per acre. Two harrowings after planting 25 cents per acre. A team can cultivate in the neighborhood of seven acres per day at a cost of $3.25 or 45 cents per acre. Three cultivations $1.35. Husking costs at least 4 cents per bushel.

Giving an acre of average Madison county corn land $6.00 worth of labor, it should produce a larger yield than the average yield of the county. Under such conditions as mentioned a yield of forty-five bushels per acre should be obtained.

Not considering rent the cost would be over 15 cents per bushel. Since the average yield of Madison county is about thirty-five bushels per acre, with $4.50 worth of labor it would still cost 15 cents per bushel to produce, and with the rent added, 28 cents per bushel.

SUMMARY.

Rent	$4.60
Breaking stalks	.20
Raking and burning	.30
Discing before plowing	.35
Plowing	1.25
Discing after plowing	.15
Harrowing	.25
Seed	.15
Planting	.25
Harrowing	.25
Cultivating	1.35
Husking 45 bushels at .04	1.80
Total cost per acre	$10.30
Per bushel	.23

COST OF CORN PRODUCTION.

John Burch, before Madison County Farmers' Institute.

Generally estimated by Iowa farmers, forty acres of corn can be produced somewhat cheaper than can twenty or thirty acres, for the reason that the same amount of equipments are required for the latter as the former; viz.:

1st Team	$250
2d Harness	35
3d Plow	14
4th Harrow	12
5th Planter	40
6th Cultivator	25

Average life time of a team, twelve years; implements, nine years. Figuring for team and interest on money invested for twelve years at a total of $1713.04, and that it will take four months to plow, harrow, plant and cultivate the forty acres we arrive at a cost for team work of $47.85, or $1.21 per acre.

Figuring cost of harness, plow, planter and cultivator, 6 per cent on investment, and 10 per cent for depreciation, with 7 per cent for repairs, we arrive at a total cost of $39.09 per year, or 9 2-3 cents per acre.

Estimating that it will require fifty-six days labor at a cost of $1.50 for wages and board, a total of $84.00, and for 6 1-2 bushels of seed at $1.50 per bushel, or $9.25; a total of $9.25 for labor and seed, or $2.33¼ per acre

RECAPITULATION.

Team work	$47.85
Harness and machinery	39.09
Labor and seed	93.25
Total	$180.19
Or per acre	$4.50
Interest on land value per acre	3.50
Taxes	.96
Fencing and repairs	.52
Total cost per acre	$9.48

Figuring a yield of 37 bushels per acre the cost of production per bushel would be $0.256.

GROWING POP-CORN COMMERCIALLY.

FROM ORANGE JUDD FARMER.

Any soil that will produce a good crop of field corn will be satisfactory for pop-corn. As the plant is less rugged than Indian corn, it will pay to have a rich loam in a high state of cultivation. If it is not naturally rich, add twenty-five to forty loads of stable manure per acre, plow deeply, harrow thoroughly, see that the seed bed is well compacted before planting. Go over the ground with a harrow just before the seed is put in, so that all weeds that have started will be killed. Plant in rows, much as ordinary field corn. The rows must be three feet apart, with one stalk about every six or eight inches in the row. Some varieties stool very readily, producing occasionally twelve stalks from a single seed. If this kind is chosen, care must be taken not to get it too thick. The tendency is to drop too many seeds in a hill; consequently it is almost always necessary to thin the young plants after they are well started.

As the plants are small and weak at the start, it is always desirable to delay the planting until the soil is well warmed up. Care must always be taken at the first cultivation so as not to injure the young plants. Give about the same treatment as corn, keeping the soil free of weeds and well pulverized. The land should be well drained, as the crop will not do well if excessive moisture is present. The crop may be thoroughly ripened in the field, when it can be husked out and stored in a dry place in barrels or bins so arranged that mice or rates cannot get at the ears. Or the corn can be cut, tied in bundles, and stored in the field or on a scaffold in the barn until work is not pressing, when it can be husked at leisure.

The best varieties for market are White Pearl and White Rice. The White Rice is small and rough and is considered very desirable for home use. White Pearl is very productive and is the standard market sort. The variety called Golden Queen is exceedingly prolific and is said to be profitable as a market crop. Amber Rice is much like the White, except its amber color. Where one can indulge in the luxury of having a number of varieties this is a nice addition.

There is a mistaken idea that the supply of pop-corn is not nearly equal to demand. There is some variation. One year there may be a shortage and another year a surplus. It varies just as other crops. Large markets like Cincinnati, Columbus, Chicago, Philadelphia and New York consume considerable quantities, and these cities are considered the best The variety called Golden Queen is exceedingly prolific and is said to be wholesale markets in the United States. The smaller towns are usually supplied by local growers.

The price varies considerably. In New York it ranges from $25 to $40 per ton, depending upon the variety and the amount on the market. In Chicago the price also varies, depending largely upon the supply. For car-load lots $1.25 and $1.50 per 100 pounds on the cob is usually considered a pretty good figure, while on the regular market prices range all the way from $1 to $1.75 per 100 pounds, occasionally going slightly higher. This is at an average of $20 to $35 per ton.

If the autumn has been very dry, the corn can be used the first season, but as a rule it contains too much moisture and should be held over until the next year. Keep it in a fairly dry place, well protected. If marketed the same season it will generally not pop well, and this tends to lessen the demand. The yield per acre varies considerably, the range being 1000 to 2000 pounds. The smaller varieties, like rice, for instance, do not produce so much per acre, but usually bring a higher price. White Pearl and Mammoth Queen, which have larger ears and consequently produce more per acre, are not so expensive. Compared with Indian corn the return per acre is usually grater, but it costs more to raise it, as the ground must be in better condition and the plants must be given better culture, particularly in the earlier stages. Moreover, it is generally considered a market garden crop, and in smaller cities there is no steady market for it, and occasionally there is a loss in selling. Ordinary field corn is a surer crop, is more easily handled; but where the grower is favorably located, and is reasonably sure of a market, an acre or two of pop-corn might be more profitable.

GROWING AND MARKETING POP-CORN.

By Harry Slater, Iowa, in *Orange Judd Farmer.*

I know of no better way to cover the subject of pop-corn culture than to give my twenty-four years' experience in growing, curing and marketing White Rice pop-corn. The reader of this article may draw his own conclusions as to the advisability of engaging in the business.

In the spring of 1880 I came to Iowa from Whiteside county, Illinois. There was nothing here at that time but prairie. I brought a little pop-corn along and planted it in the sod broken that spring. The summer being quite wet, it made a fair growth, and the quality was No. 1. The following spring I planted one acre and worried constantly as to how I was going to gather the crop and find a market for so much pop-corn. Well, in the fall at gathering time I went in the field and snapped it and threw it into an old corn-crib. I had two big wagon loads of snapped corn. The next day I invited the all neighbor boys to help me husk it, and by twelve o'clock at night we had the last nubbin husked. Oh! what a sight—enough corn to supply the whole Untied States and some for export, so I thought. This corn weighed 2500 pounds and it sold in Chicago at 6 cents per pound, a pretty good price for an acre of corn.

This set me to thinking and the next year I planted 5 acres and received 4 cents per pound; the next year I planted 10 acres, and the neighbors thought I was crazy to put in so much pop-corn. It seemed to them I never could find market for so much, but I kept right on doubling my acreage until I got up to 150 acres. The price kept coming down all the time, until at the present time if we can get 1 cent per pound from the field we still call it a paying crop.

PUTTING IN THE CROP.

Any soil that will produce good field corn will grow pop-corn; the better the soil the better the quality, and quality is what sells it, the same as anything else. Tame sod fall plowed is the ideal ground for the growth of pop-corn. The ground should be put in the very finest shape possible by using the disc and harrow thoroughly. About May 10 is the proper time to plant. Pop-corn should be drilled about one or two kernels every foot and covered two inches deep. It will sprout and come out of the ground three days quicker than field corn. The silk-like covering of the heart is so much thinner than field corn that it absorbs moisture and sprouts quicker. It will require one bushel of shelled corn for ten acres.

We cultivate it the same as field corn. I find the disc cultivator is the best tool I have ever used for this business, having increased my yield 500 pounds per acre by actual weight. Large shovels seem to disturb too many of the feeding roots. A six-shovel plow does the work very nicely, but the disc is my favorite. Be sure, however, and keep the weeds down, if you have to use a hoe. This will apply to any crop. I think any planter with a good drill attachment will do the work satisfactorily. Now if you have followed my advice, you have brought your corn to the time of gathering. We will next turn our attention to final stages of work on the crop.

GATHERING POP-CORN.

The average time to gather the crop with us is September 25. This date is about four weeks ahead of field corn. Before we gather we must have our cribs in proper shape and have a ventilator running through the cribs lengthwise. This should be made by sawing 2x4s 3 feet long and nailing them together at the top, and spreading them to about 16 inches on the bottom, leaving them in the form of a V. with the wide end on the floor; then nail on 4- or 6-inch boards, leaving the cracks 1½ inches wide. This will give you a free circulation of air clear through the crib, and prevents the corn from molding. Last fall I put up two cribs 100 feet long by 12 feet wide and 10 feet high. I filled one of them the first week in October, just six days from the time we commenced, and the corn came out in the summer as bright as a dollar. This ventilator was 4 feet high, but 12 feet is wider than the average crib, so I think 3 feet high will thoroughly ventilate a crib 8 or 10 feet wide. If the weather is inclined to be damp at husking, nail two 8-inch boards together in the form of a hog trough, leaving a crack on top. This will do, as you get the crib filled up pretty well. Some husk their corn in the field. This is a very good way, but my favorite plan is to snap it and then husk it in the crib. By so doing the women and children can husk about as much as a man, and you have an abundance of good feed for the cattle and hogs, as there is always some poor corn that must be sorted out. It always pays to have the corn in the best shape possivle. It is the appearance that sells it; and furthermore, if it is put in the crib with a lot of silks and husks, a blue mold forms and spoils it.

MARKETING POP-CORN.

This is the most important subject of all, and I suppose it may be applied to any of the farm crops, but on pop-corn it means make or break.

The methods are changing constantly. The first ten years of my experience corn was handled exclusively on the cob, but of late the bulk of it is shelled and cleaned and put in two-bushel sacks, all ready for the popper. In shelling we use a cylinder power sheller, but a spring sheller will answer the purpose very well. We can shell about 100,000 pounds per day at about the same cost as field corn. Occasionally a customer will want it shelled and loaded in bulk. This is a nice way, as it saves a whole lot of hard labor. Shelled popcorn is the heaviest grain that grows, testing sixty-four pounds to the bushel. There is no standard weight for it; it is all handled by the hundred pounds.

I sold one year two cars to a Boston man, and we put it up in one-pound paper cartons and packed sixty in a wooden case, like soap. This makes a very nice package for a merchant to place on his shelves, but by the time a farmer fills 48,000 of these boxes he wishes for some other mode of operation. I built a galvanized-iron floor large enough to hold a car-load of corn, and dried it by steam. This did not pay, as it cost me for fuel and labor more than I got extra for the work. All corn shipped west of the Missouri river has to be shelled, as the freight is too high to load on the cob, and on account of the dry atmosphere it can be handled early in the fall without danger of molding, but the nearer the coast we get the drier it has to be. We have shipped corn down east that popped perfectly when loaded here that wouldn't pop well on arrival at destination. It is very sensitive to moisture.

WHOM TO SELL TO.

I believe there are more rascals handling pop-corn than in any other line of business. When I find an honest man I stick to him like a brother. I have shipped car-loads of pop-corn that hardly paid me freight, not on account of the corn being damaged, but on account of the man who rceeived it being dishonest. Some firms will offer a good, stiff price for corn, and when they get it they will have a kick on quality or something else and compel the seller to take less than the agreement, or refuse the corn, and the seller must accept their price, rather than pay freight both ways.

The town of Odebolt, Iowa, sends more pop-corn to market than any other town in the United States. The average consumption of pop-corn for the last five years has been about 300 car loads for the United States. A great many people ask me what becomes of all this corn that is grown here, and when I tell them that it is all popped and consumed they will hardly believe me. A great many people have the idea that it is manufactured into some kind of breakfast food, or used as an adulteration of flour. This is not so. In the first place, pop-corn is too expensive to admit of its being used for this purpose.

All through the mountain regions there are little towns that are quite large consumers of pop-corn. In the South there is but very little corn grown, and this is another very good market. The largest consumers of pop-corn are the New England states. Prbably three-fourths of all the pop-corn grown is consumed east of the Mississippi river, although there is hardly a town in he United States of 50,000 population but what will consume one to three car-loads a year. We ship corn from one coast to the other, and from Minneapolis on the north to Galveston on the south.

F---Regarding the Silo.

CROPS FOR THE SILO, COST OF FILLING, AND EFFECT OF SILAGE ON THE FLAVOR OF MILK.

By Wilber J. Fraser, Chief in Dairy Husbandry, University of Illinois, Experiment Station Bulletin No. 101.

ADVANTAGE OF SILAGE.

The digestive organs of animals that chew the cud are so formed as to require comparatively juicy and bulky food. The cow cannot, therefore, thrive on exclusively dry food so well as can the horse. The nearest an ideal food that can be obtained for the dairy cow is good pasture; but for more than six months in the year green pasture is not available in Illinois. The best substitutes to use during this period are corn silage and such roots as mangels and turnips. Corn yields an average of twice as much dry matter per acre as do root crops; and, since the latter require much more labor, which in this country is relatively expensive, silage is far more economical.

Making corn into silage is a means of preserving the grain as well as the stalk in the best possible condition for feeding and without the expense of shelling and grinding. In feeding whole corn, either in the ear or shelled, many of the kernels are not digested. With silage, the grain being eaten with the roughage, nearly all the kernels are broken during mastication, and, since they are somewhat soft, are practically all digested.

By the use of the silo the corn is removed from the field at a time when no injury is done the land by cutting it up while soft. As the corn is cut before the blades are dry enough to shatter, there is no waste from weathering, and both stalk and grain being in good conidtion, the whole crop is consumed by the stock; while with dry shock corn a large pecentage of the leaves and butts of the stalk is wasted.

It has been determined that one cubic foot of hay in the mow contains about 4.3 pounds of dry matter, and that a cubic foot of silage in a thirty-six foot silo contains about 8.9 pounds of dry matter. From this it is evident that a cubic foot of space in a silo of proper depth will hold more than twice as much dry matter as the corresponding space in a mow. It is also true that on the average a larger amount of digestible feed can be obtained from an acre in the form of silage than in any other way at like expense. Making corn into silage is then both an economical and compact method of storing feed.

Much damage has been done to the cause of silage by the extravagent claims of its over-enthusiastic friends. Although corn silage is not a complete and balanced ration in itself, it is so well relished that large quantities are consumed. Being a succulent feed, it tends to heavy milk production, and should be given an important place in the ration of dairy cows It has proved an important factor in steer feeding as well as in milk production, but a steer cannot be finished on silage alone, any more than a cow can produce her best yield of milk on such a ration. To obtain the most economical returns, some dry roughage should be fed in connection with silage, and a legume hay, as alfalfa, clover, or cowpeas, is the best feed for this purpose, particularly for young stock and cows. Economical milk con be produced from these feeds without the addition of grain, if the cows are not giving more than two gallons of milk a day, providing the corn was well eared and both the silage and the legume hay are of excelent quality. Cows giving a larger yield must have grain added to their ration.

VALUE OF SILAGE IN PLACE OF SOILING.

A pasture will carry much more stock during spring, early summer, and fall, than it will through the hot, dry weather of midsummer. By helping the pasture out at this season with partial soiling, the cattle not only have better feed during this critical period, but more stock can be carried on a given area than by pasturing alone. As land increases in value and farming becomes more extensive, there is greater need for soiling, and the most satisfactory method of providing a substitute is by means of the silo. It requires too much labor to cut green crops every day and haul them to the cows, and besides there is necessarily a great loss in being obliged to feed the crops before they are fully mature and after they are over-ripe.

No crop furnishes more feed to the acre than corn, and with the silo it can be used for soiling, thus permitting the whole crop to be harvested when at the right stage of maturity and fed when needed, saving both feed and labor.

CROPS TO RAISE FOR THE SILO.

In Illinois corn seems to be the best single crop for the silo. It not only produces a large quantity of nutritious feed that is easily placed in the silo, but is is of such a nature as to pack readily and keep well. The large southern varieties of ensilage corn, which give enormous yields in tons per acre, have been recommended for silage; but such varieties do not produce much grain and the total nutrients are usually less than

Cut 1.—Filling the Silo with small cutter and large engine. Cutter exploded from being given too much power.

from ordinary field corn. The best results are obtained with some variety that will give a good yield of grain, and by planting somewhat thicker than for a grain crop. Under average condiitons a larger tonnage of feed can usually be obtained per acre by combining corn, sorghum, and cowpeas or soy beans, but even with this combination the greater part of the crop should be corn.

Legumes, as clover and cowpeas, have the power, through bacteria on their roots, of utilizing the free nitrogen of the air and storing up within themselves a comparatively large amount of that most necessary constituent of food known as protein. By so doing they not only produce a food rich in protein without exsausting the soil, but enrich the soil by adding to its nitrogen. While they do not benefit the crop they are grown with, they do benefit the succeeding ones. When either peas or beans are grown with the corn and the entire crop is put into the silo, the feeding value is greater, ton for ton, than that of corn alone. This is a much more economical method of obtaining protein than by purchasing it in high priced concentrates, as gluten meal, oil meal, etc.

If cowpeas are planted at the same time as the corn and in the rows with it, they will usually make a fair growth. Since the vines will run up the corn stalks, the entire crop can be cut with the binder the same as corn alone, making practically no extra work in filling the silo. The only difficulty in harvesting corn and cowpeas with the corn binder is that, if the corn is missing for a rod in the row, there is nothing to carry the peas back into the binder, and it is likely to clog. Where there is a fairly uniform stand of corn, all can be readily bound together. As the stalks of soy beans are much stiffer than those of cowpeas, no difficulty is experienced in cutting them with the corn.

INCREASE OF NUTRIENTS DURING MATURITY.

It is of great importance to know at what stage corn should be cut to secure the best results, how rapidly nutriment is stored up in the corn plant as it approaches maturity, and when the maximum amount is reached. The following table illustrates this point:

Table 1. Water and Dry Matter in Corn Crop at Different Periods after Tasseling. New York (Geneva) Station.

Date of Cutting.	Stage of Growth.	Corn per Acre.	Water per Acre.	Dry Matter per Acre.
		Tons.	Tons.	Tons.
July 30	Fully tasseled....................	9.0	8.2	.8
Aug. 9	Fully silked......	12.9	11.3	1.5
Aug. 21	Kernels watery to full milk	16.3	14.0	2.3
Sept. 7	Kernels glazing....................	16.1	12.5	3.6
Sept 23	Ripe...............	14.2	10.2	4.0

In the last column is shown the dry matter per acre in corn at different stages. When the corn is fully tasseled it contains but eight-tenths of a ton of dry matter par acre, or only one-fifth what it contains when fully ripe. When in the milk it contains nearly three times as much dry matter as when fully tasseled. Only seventeen days were occupied in passing from the milk to the glazing stage, yet in this time there was an increase in the dry matter of 1.3 tons per acre. This shows the great advantage of letting the corn stand until the kernels are glazed. After this period the increase in dry matter is but slight.

TIME TO HARVEST.

To have the silage keep well the corn must be cut at the proper stage of maturity. If cut before it is sufficiently matured, too much acid develops. If too ripe, it does not settle properly and the air is not sufficiently excluded to prevent spoiling.

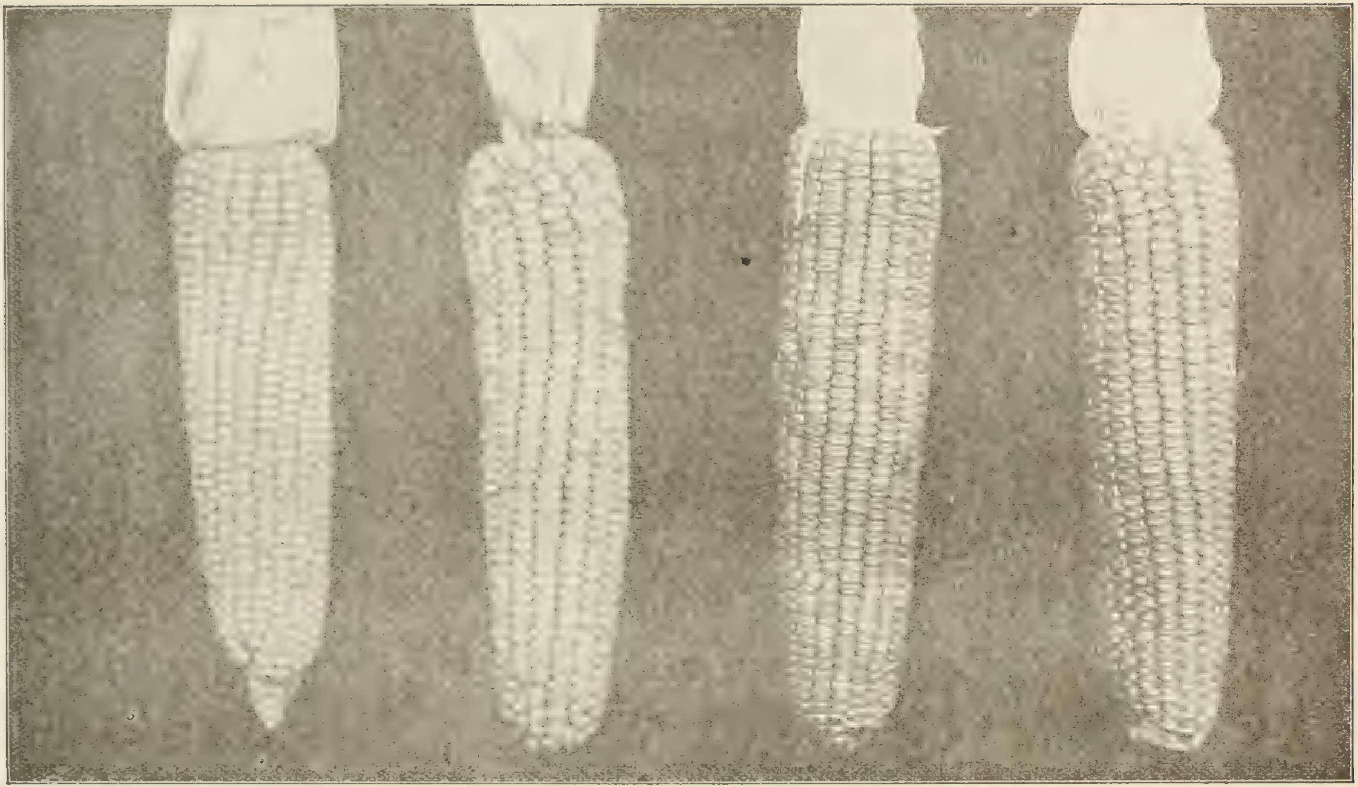
Corn should not be cut until the ears are out of the milk and most of the kernels glazed and hard. In Cut 3, No. 1 is in the soft dough stage; No. 2 is beginning to dent; No. 3 is nearly all dented, but a few kernels are still in the milk; No. 4 shows all of the kernels dented. When corn is put into the silo it should usually be as ripe as ears No. 3 and 4. In case the weather has been so hot and dry that the lower leaves have fired, the corn should be cut before the ears are qutie so far advanced. Much riper corn will keep at the bottom of the silo than at the top because of the greater pressure which excludes the air more completely. It is, therefore, important that the ripest corn be cut first and placed in the bottom of the silo .

METHOD OF HARVESTING.

The corn should be cut with a corn binder, as it is much more easily handled when bound in bundles. If the silage cutter is large and the work is pushed with a good force of men, the corn binder should have a start of half a day. If enough horses are used on the binder to keep it moving at a good pace the corn can usually be cut down as fast as it can be put into the silo.

It is always wise to have a silage cutter of large capacity, as much less labor is required in feeding it, and if the bundles are small, the bands need not be cut. Using a small cutter with a large engine is dangerous unless great care is exercised in controlling the power. Cut 1 shows a small sized cutter filling a silo in the center of a barn. The day following the taking of this picture the machine was given too much power and the cutter wheel exploded. A piece of the wheel was found twenty rods distant and another piece was thrown through the inch siding of the barn, but fortunately no one was injured.

The chain elevator, as shown in Cut 5, is still occasionally used, but is likely to cause trouble. Where a carrier of this kind is desired, the single chain gives the best satisfaction. The customary, and usually the most satisfactory way of elevating the cut material is by means of the blower, as shown in Cut 6. To obtain the best result and not to be annoyed by clogging, the blower pipe should be run as nearly perpendicular as possible.



No. 1. Soft-Dough Stage.
No. 2. Half the Kernels Dented.
No. 3. Nearly all Dented.
No. 4. All Kernels Dented.

Cut 3. Corn for the Silo should be as ripe as ears 3 and 4 providing leaves are still green.

ESSENTIALS OF SILO FILLING.

If silage is to keep well it must settle evenly. To this end the leaves and the heavier parts of the corn must be kept thoroughly mixed and evenly distributed in the silo. Owing to the great lateral pressure of silage, friction with the sides of the silo has a tendency to make the silage less compact at the edge, and for this reason it should be kept thoroughly tramped next the side. Every time three or four inches of cut material is added to the silo it should be tramped thoroughly around the edge, taking short steps and packing the silage as much as possible next the wall. These precautions must be observed during filling to obtain perfect silage.

If the corn is so ripe that none having green leaves at the bottom of the stalk can be obtained to finish the last four or five feet at the top of the silo, water should be run into the carrier and the corn well soaked. If the corn is green, only enough water need be used to soak the upper six inches of silage.

Many different forms of covering for silage have been advocated, but it is usually found more practical to finish with the same material as that with which the silo is filled. Frequently a saving can be made by snapping off the ears and using the stalks alone, or by running enough straw, chaff, or weeds through the cutter to cover the silage from four to six inches deep. If pressure is available, water can be run into the carrier to saturate this material. The top must be thoroughly soaked once and the whole surface well tramped every day for a week to exclude the air as much as possible. This tramping should be especially well done around the sides, so that the air cannot gain acess next the wall. The object of wetting the surface is to obtain as quickly as possible a thin layer of thoroughly rotted silage, which will seal the top, thus excluding the air and preserving the silage below.

If water is not added to the top, the heat dries out the silage, which may then "fire fang" to considerable depth, entailing a great loss.

COST OF FILLING..

That data on the cost of filling silos, from which the Table 2 has been prepared, were secured by representatives of the Experiment Station, who went to different parts of the state when men were filling silos and kept accurate records of the work in progress.

In these records the time work began in the morning and stopped at night was noted, allowance being made for whatever time was taken at noon. With the exception of a few cases on dairy farms, where some of the men quit early to milk, no allowance was made for time lost after the cutter started and men and teams were ready for work, a full day being counted unless for some reason all work stopped and men and teams were at liberty to leave.

To reduce the cost of filling the different silos to a like basis, the charge made in these records for each of the various operations was uniform, and as near as possible to the average price paid. The labor of the men was charged at $1.25 and of the teams at $1.00 each for a day of ten hours. This was considered a fair price, as the time of year in which silos are filled is not usually an especially busy season on the farm. In most cases the man who had the silo also owned an ensilage cutter, and a uniform charge of $2.00 a day was made for wear on the machine and interest on the money invested. The engine, including the engineer, was charged for at $5.00 a day; fuel at $3.00 a ton for coal and 15 cents a gallon for gasoline; twine at 11 cents a pound. The charge for machine and engine, fuel, twine, and labor of men and teams, gives the total expense of filling the silo.

To determine the capacity of the different silos the diameter of each and the depth of the silage after settling forty-eight hours were carefully measured. From these dimensions the number of tons of silage was estimated from a table on the capacity of silos. Having the acres cut, total cost of filling and tons of silage, the tons per acre and average cost per ton of putting up silage were computed.

The cost of filling ranged from 40 cents to 76 cents per ton, the average for the total number of tons put up being 56 cents. This variation was caused by the distance the corn was hauled, and the ability of some farmers to arrange the work more systematically and push it with greater energy than others.

Cut. 5.—Filling the Silo: Chain Carrier.

TABLE 2.—DATA ON COST OF FILLING SILOS.

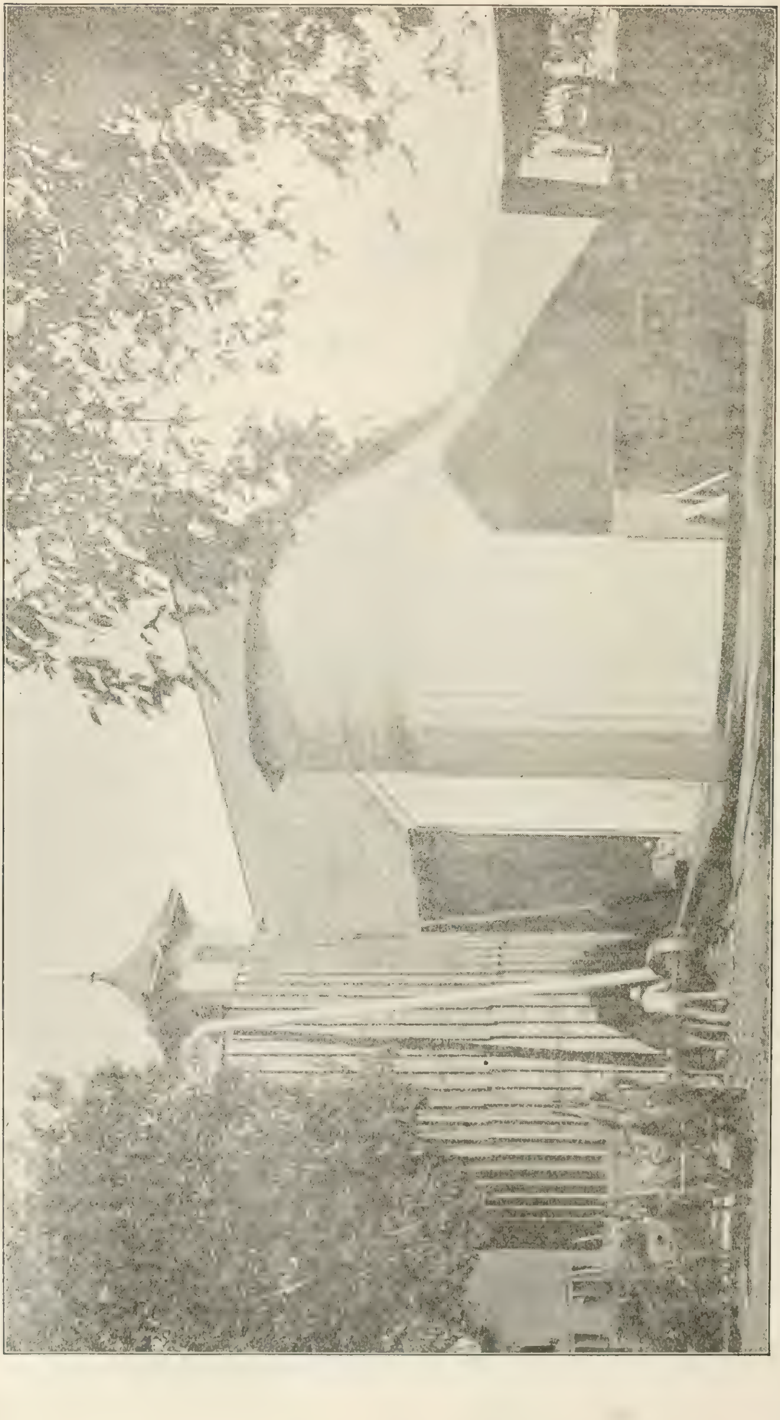
Farm number	1	2	3	4	5	6	7	8	9
Diameter silo, feet	18.25	18	22	18	19	18 8	11.8x12 9 (Square.)	20	*20
Depth silage, feet, after settling 48 h	31	23.5	24	27	33	29.5	22.7	22	38
Tons silage estimated from above dimen	163.7	106.4	163.7	129.8	193.1	161.5	61.2	119.6	785.7
Acres cut	27 3	15 5	25	15 4	20	21.25	10	16	67.7
Tons per acre	5.99	6.86	6 55	8 4	9 65	6 66	6.12	7 47	11.6
Distance hauled, rods	100	110	160	60	160	80	60	20	100
Teams hauling	6	5 5	6.5	4	3 5	3.5	3.5	1	7
Days' labor, teams, 10 h	21.5	13.6	21.9	12	20.25	16.55	7	9.3	70.4
Days' labor, men, 10 h	36.3	17.7	36.4	19.3	33.3	25.9	15.75	16.5	145.25
Kind of cutter	Papes	BelleCity	Belle City	Star 18	Star 17	Star 16	Blizzard 12	Blizzard 11	Porter Bros.
Kind of elevator	Blower	Blower	Blower	Carrier	Carrier	Carrier	Blower	Blower	Carrier
Length of cut, inches	.75	.5	.5	1.25	1	1	.5	.5	2
Size of engine, h. p	15	20	20	12	8	8	17	12	16
Engine hire	$16.50	$10 50	$16.00	$11.00	$23.75	$20.00	$8.00	$7 50	$39 00
Use of cutter	6.60	4 20	6.40	4.40	9 50	8.00	3.20	3 00	15.60
Cost of fuel	6.30	3.75	6.00	2 25	6 75	7.05	1 95	4 05	16.50
Cost of twine	6 87	7.15	12.00	5.72	7 15	6.87	2.09	6.05	34.75
Labor, $1. 25 a day	45.37	22.14	45.50	24.12	41.62	32.37	19 69	20.62	181.56
Teams, $1.00 a day	24.50	13 60	24.90	12.00	20.25	16.55	7.00	9.30	70.40
Cost of filling silo	106.14	61.34	110 80	59.49	109.02	90.84	41.93	50.52	357.81
Cost in cents per ton	.65	.58	.68	.46	.56	.56	.63	.42	.46

*Three silos same size.

TABLE NO. 2—CONTINUED.—DATA ON COST OF FILLING SILOS.

Farm number	10	11	12	13	14	15	16	17	18	19
Diameter of silo, feet	11	20.6	* 14,13.3	15.25 (octagon)	9.75	16	16	16.3	† 20,12	† 20,12
Depth silage, feet, after settling 48 h.	27	31.7	29	20.5	19.75	28	22	20	31.5,18	28.8,24
Tons silage estimated from above dimensions	78.6	244.28	166	65.8	21.5	108.1	76.5	69.86	260.1	224.85
Acres cut	13.75	33.25	17.5	......	3.6	11.5	6	6	40	21
Tons per acre	5.71	7.34	9.48	......	6.	9.4	12.75	11.64	6.51	9.36
Distance hauled, rods	68	235	160	30	215	80	100	60	360	240
Teams hauling	5.5	7	6	4	7	5	4	4	7	6
Days labor, teams 10 h	8.7	37.4	22.6	9.5	4.35	11.38	5.25	5.25	43.6	31.6
Days labor, men, 10 h.	13.7	54.9	44.2	15.8	7.2	19.4	11.4	12.7	69.9	53.3
Kind of cutter	Ohio 18	Ohio 18	Ohio 18	Blizz'd 12	Blizz'd 14	Ohio 18	Ohio 18	Ohio 18	Blizz'd 14	Blizz'd 14
Kind of elevator	Blower	Blower	Blower	Blower	Blower	Blower	Blower	Blower	Blower	Blower
Length of cut, inches	.5	.5	.5	.5	1	.75	.5	.5	.5	1.25
Size of engine, h. p	20	20	20	17	18	15	20	20	18	20
Engine hire	$ 5.50	$ 20.00	$ 15.00	$ 8.50	$ 2.25	$ 7.00	$ 1.38	$ 1.38	$21.50	$18.50
Use of cutter	2.20	8.00	6.00	3.40	.90	2.80	1.75	1.75	8.60	7.40
Cost of fuel	3.00	9.00	6.00	2.70	1.00	3.00	3.00	2.25	11.02	9.00
Cost of twine	4.18	8.80	5.91	3.30	1.10	5.10	1.65	1.65	10.72	6.05
Labor, $1.25 a day	17.12	68.62	55.25	19.75	9.00	24.25	14.25	15.87	87.37	66.62
Teams, $1.00 a day	8.70	37.40	22.60	9.50	4.35	11.38	5.25	5.25	43.60	31.60
Cost of filling silo	40.70	151.82	110.79	47.15	18.60	53.53	30.28	31.15	185.81	139.17
Cost in cents per ton	.52	.62	.67	.72	.76	.50	.40	.45	.71	62

* Two silos same depth.
† Two silos



Cut 6.—Filling the Silo: Showing Position of Blower Pipe.

THE CONSTRUCTION OF SILOS.

WILBER J. FRASER, Chief in Dairy Husbandry, University of Illinois, in Experiment Station Bulletin, No. 102.

INTRODUCTION.

There has been much discussion through the agricultural press and at farmers' institutes concerning the importance of the silo and the advantages and disadvantages of the different styles of construction. As yet, however, comparatively few dairymen and stock raisers of Illinois fully appreciate the value of silage, and as there are not one-tenth as many silos in the state as the economy of silage as a feed, especially for dairy cows, would warrant, the Experiment Station has deemed it wise to issue two bulletins on this subject.

Bulletin No. 101, discusses the subject of crops for the silo and cost of filling. The aim of this bulletin is to direct attention to some of the essential points in silo construction and also to show the serious defects in some styles of silos, both in the material used and in the manner of construction. Cheap silos which are poorly built have done much to injure the cause of silage, for since they do not preserve their contents perfectly there is necessarily great loss. The problem is, therefore, to build an enduring, air-tight, rigid structure at least expense.

ESSENTIALS OF A SILO.

There are several points that must be closely observed in making silage if it is to be well preserved, and the neglect of any one of these will make, in the final result, the difference between success and failure. These essentials are close packing, when the crop is at the proper stage of maturity, in an air-tight structure having perfectly rigid walls.

The stage of maturity and method of packing were treated in Bulletin No. 101. Of equal if not greater importance, is the proper construction of the silo. If the sides of the silo are not air-tight, the air which passes through will cause the silage to spoil, and if the walls are not perfectly rigid, the pressure of the silage will cause them to spring out, allowing the air to enter between the silage and the wall. In either case the result will be the same—decayed silage.

The outward pressure on the wall of a silo filled with cut corn is about 11 pounds for every foot in depth; making a pressure of 110 pounds at a depth of 10 feet; 330 pounds at a depth of 30 feet; and the enormous pressure of 440 pounds per square foot at a depth of forty feet. This increase in pressure as the depth increases must be considered in silo construction and the lower portion made much the stronger.

Before building a silo the most careful attention should be given to location, size, form, and method of construction. These will differ somewhat according to locality and individual needs. A brief discussion of these questions follows:

LOCATION.

As silage contains about 80 percent water it is a heavy feed to handle and, to avoid unnecessary labor in feeding, the silo should be placed as near the manger as possible, preferably at one end of the feeding alley. If the silo is inside the barn the silage chute should be provided with a door which should be kept closed to prevent the silage odors from entering the barn at milking time, thus avoiding the possibility of their being absorbed by the milk.

Cut 5.—Showing Connection of Silo with Barn.

FORM OF SILO.

Nearly every one who builds a silo adds some new feature, giving rise to a great variety of shapes and methods of construction. Before building a silo it is well to consider both the advantages and the disadvantages of the different styles, as well as the cost of each. It should be borne in mind, however, that no silo is cheap, no matter how small the first cost, if it does not preserve the silage perfectly. The first silos in this country were usually built inside the barn and consequently the square form was commonly used in order to utilize the space more completely. The square silo has not proved satisfactory, however, as it is practically impossible to build this form so that the side walls will not spring out and allow the air to pass down between the silage and the wall, which invariably results in the rotting of the silage. Another difficulty with the square form is that the silage does not settle readily in the corners and there is consequently considerable loss from this cause.

An example of great loss owing to the form and faulty construction came under the writer's notice a few years ago when a square silo with a capacity of fifty tons, was built with air-tight, but not rigid walls.

Simply the springing of the sides of the silo allowed the air to gain access to the silage to such an extent that the entire fifty tons spoiled completely. Since for mechanical reasons it is practically impossible to build a square wood silo with perfectly rigid walls, the round silo is the only proper form.

Silage has been put up at the University for the past seventeen years. The first silos were square and built inside the barn. These were made of two thicknesses of ⅞ inch flooring with paper between. After having been used seven or eight years the double walls began to show signs of decay, and after nine years the walls were so badly rotted that the silo was useless. If silos are to be built of wood the wall should be of but one thickness. The difficulty with double walls is that moisture gets in between the two layers of wood and as it does not dry out readily, decay follows rapidly.

PROPORTION AND CAPACITY OF SILOS.

To obtain satisfactory results, silage must be in perfect condition when fed. Since fermentation soon takes place when silage is exposed to the air, the silo should not be of too great diameter. Not more than eight square feet of surface should be allowed for each cow in winter, then, when feeding 40 pounds of silage per cow, a layer about 1½ inches deep would be fed off daily. When silage is fed in summer it is advisable that the exposed area be not over half this size so that a layer three inches deep may be used daily. However much stock is to be fed, a silo 20 to 22 feet in diameter is as large as should be built. If a silo is of greater diameter than this, much of the silage is at too great distance from the door, increasing the labor of removal.

The deeper the silo the greater the pressure and the more compactly will the silage be pressed together, hence the larger the amount that can be stored per cubic foot. For example, a silo 20 feet in diameter and 40 feet deep will hold twice as much as one of the same diameter and 25 feet deep. This shows the economy of reasonably deep silos. To be well proportioned the height should not be more than twice the diameter. No silo should be less than 30 feet deep and to get sufficient depth for a silo not over 12 feet in diameter, it may be placed 4 or 5 feet into the ground.

The number of tons of silage needed can readily be estimated from the size of the herd and the amount to be fed daily. Even where it is desired to feed as much silage as possible not more than 40 pounds per cow should be fed daily. In Illinois, silage will usually be needed from about October 20 to May 10, or 200 days. Each cow should have an allowance then of 200 times 40 pounds which is 8,000 pounds of silage, or four tons per cow for the year. A herd of ten cows will require a silo holding 40 tons; a herd of 30 cows 120 tons; 50 cows 200 tons; and 100 cows 400 tons. Where young stock is raised an allowance should be made for them. From the amount of silage needed the dimensions of a silo of the required capacity may be determined from Table 1, which gives the capacity in tons of silos of different diameters and depths. These estimates apply to silos filled with well matured corn that has been allowed to settle forty-eight hours and then refilled. It is evident that to get this rated capacity a silo which had been filled rapidly must be refilled after settling forty-eight hours.

TABLE 1. APPROXIMATE CAPACITY IN TONS OF CYLINDRICAL SILOS OF DIFFERENT DIAMETERS AND DEPTHS. COMPUTED FROM KING'S TABLE.

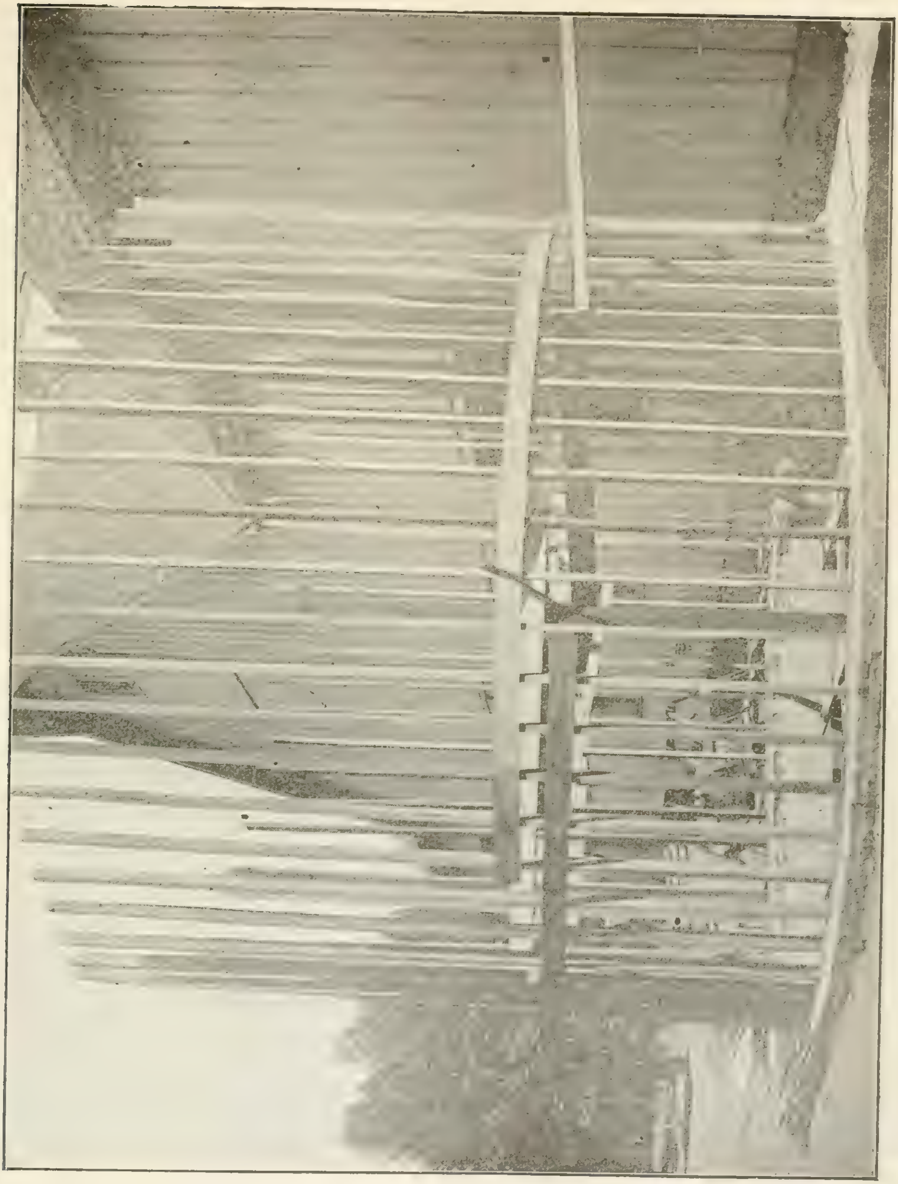
(The diameter is shown at the top of columns and depth at the left)

	INSIDE DIAMETER IN FEET.												
Depth Ft.	10	11	12	13	14	15	16	17	18	19	20	21	22
20	26.2	31.6	37.7	44.2	51.2	58.8	67	75.6	84.7	94.4	104.6	115.3	126.6
21	28.0	33.8	40.3	47.2	54.8	62.9	71.6	80.8	90.6	100.9	111.8	123.3	135.3
22	29.9	36.2	43.0	50.5	58.6	67.4	76.5	86.4	96.8	107.9	119.6	131.8	144.7
23	31.9	38.6	45.9	53.9	62.5	71.7	81.6	92.1	103.3	115.1	127.5	140.6	154.3
24	33.8	40.9	48.7	57.2	66.3	76.1	86.6	97.8	109.6	122.1	135.3	149.2	163.7
25	35.8	43.3	51.6	60.5	70.2	80.6	89.6	103.6	116.1	129.3	143.3	158.0	173.4
26	37.9	45.9	54.7	64.2	74.4	85.5	97.2	109.8	123.0	137.1	151.9	167.5	183.8
27	40.1	48.5	57.7	67.7	78.6	90.2	102.6	115.8	129.8	144.7	160.3	176.7	194.0
28	42.2	51.1	60.8	71.3	82.7	95.0	108.1	122.0	136.8	152.4	168.9	186.2	204.3
29	44.4	53.7	63.9	75.0	87.0	99.9	113.7	128.3	143.9	160.3	177.6	195.8	214.9
30	46.6	56.4	67.2	78.8	91.4	105.0	119.4	134.8	151.1	168.4	186.6	205.7	225.8
31	48.8	59.1	70.3	82.5	95.7	109.8	124.9	141.1	158.2	176.2	195.2	215.3	236.3
32	51.1	61.9	73.6	86.4	100.2	115.1	130.9	147.8	165.7	184.6	204.6	225.5	247.5
33	53.4	64.6	77.0	90.3	104.8	120.5	137.8	154.6	173.2	193.1	214.1	235.8	258.7
34	55.8	67.5	80.3	94.3	109.3	126.0	142.8	161.6	180.8	201.7	223.6	246.2	270.0
35	58.2	70.4	83.7	98.3	114.0	131.6	148.9	168.7	188.3	210.5	232.2	256.8	281.5
36	60.6	73.0	86.9	102.2	118.3	136.3	154.7	175.9	196.3	219.4	242.0	267.5	292.1
37	63.1	76.0	90.4	106.1	123.1	142.1	160.8	183.2	204.3	228.0	251.9	278.4	303.9
38	65.5	79.0	94.0	110.3	127.9	148.0	167.0	190.7	212.4	237.2	261.9	289.4	315.9
39	67.9	82.0	97.3	114.5	132.8	154.0	173.5	198.3	220.6	246.5	272.0	300.5	328.1
40	70.3	85.1	101.1	118.8	137.8	160.1	180.0	205.0	228.9	255.9	280.2	311.8	340.4

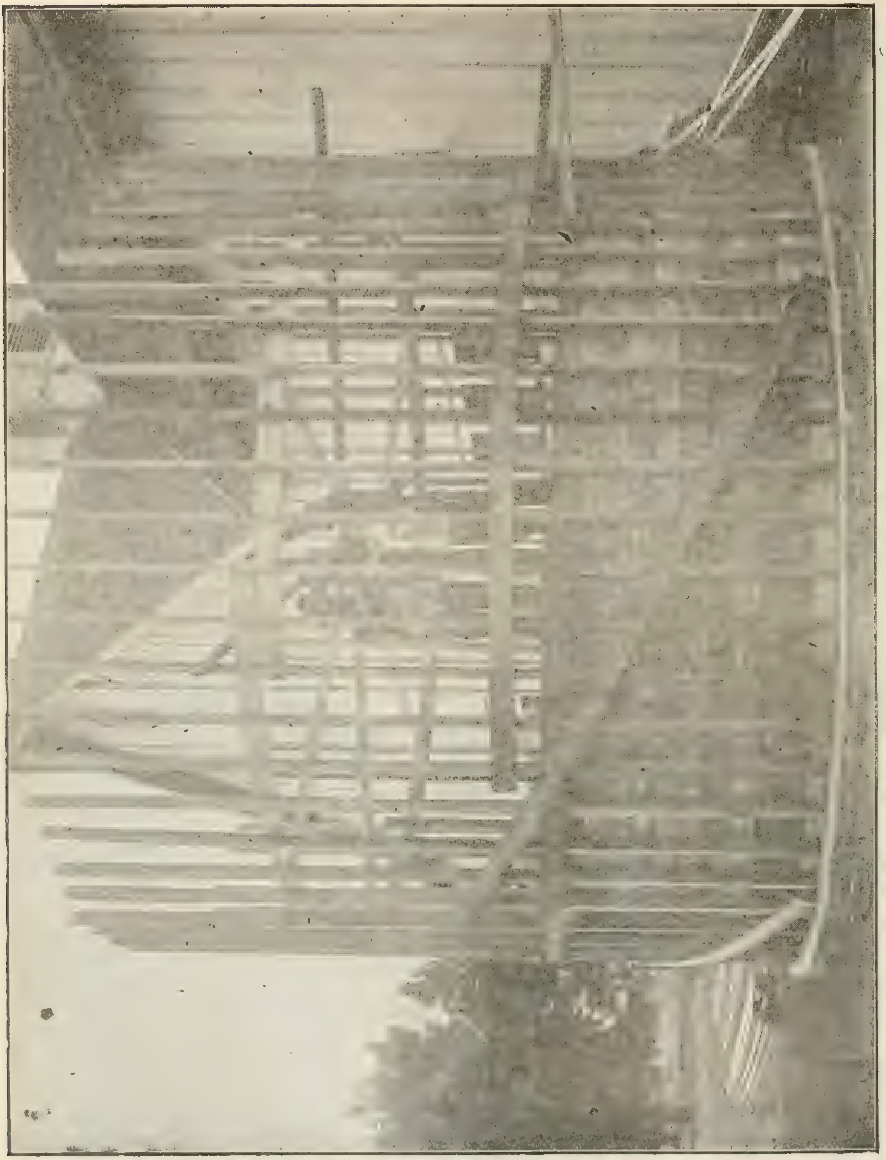
ROUND WOOD SILO PLASTERED WITH CEMENT.

The silo described below, which is 20 feet in diameter and 34½ feet deep, having a capacity of 228 tons, was built at the University of Illinois the summer of 1903. The first silos of this kind built in the state, so far as known by the writer, were three erected by Mr. H. B. Gurler of De Kalb in 1897. (This is the style of construction frequently referred to as the Gurler silo.) These three silos have been filled every year and have given most excellent satisfaction. It seems probable that silos of this construction will not only preserve the silage perfectly but will prove to be lasting as well as economical. As few silos of this type have as yet been built in Illinois, a detailed description of the one at the University is given.

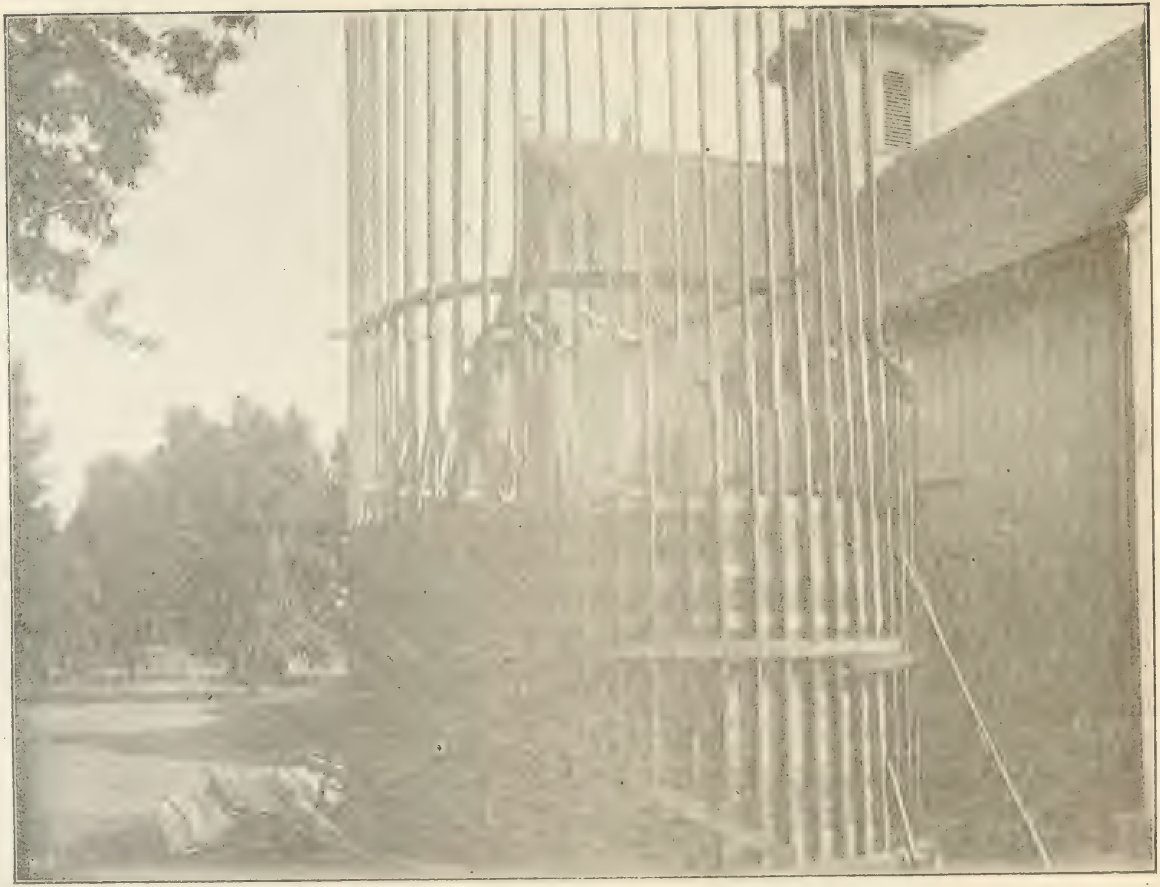
The excavation and foundation were made by cutting a circle 20 feet 10 inches in diameter and four feet deep, and laying up a four-inch brick wall against the clay. (Cut 12.) This wall was slushed in full on the back side with mortar so that every brick had a full bear-



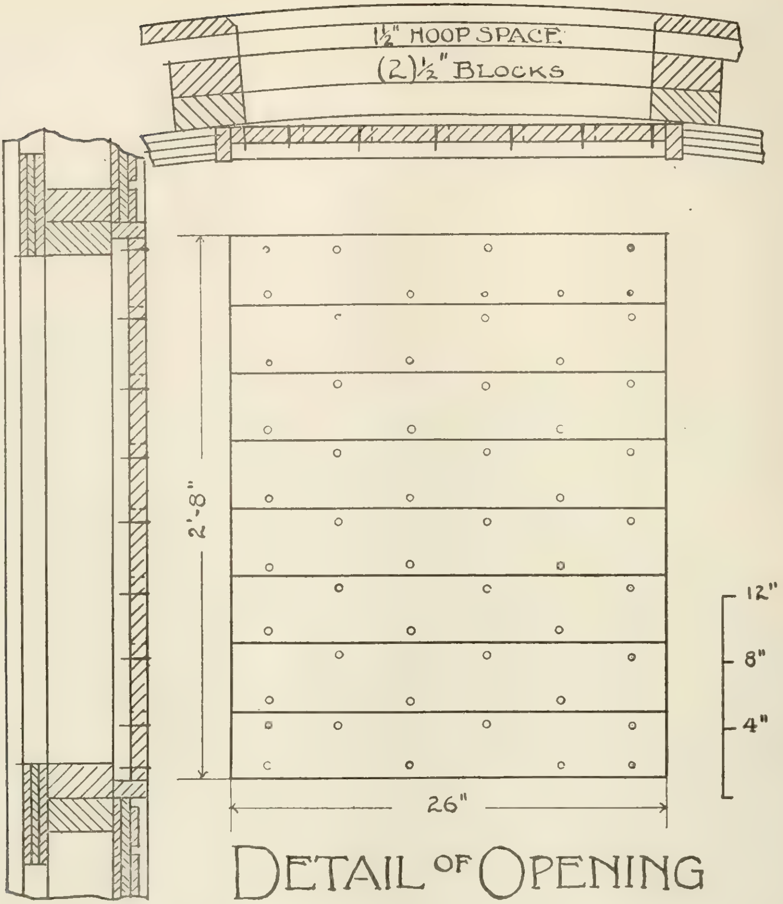
Cut 12.—2x4 Studs set on Sill and Plumbed to Height of six Feet.



Cut 13.—Silo Ceiled on Inside to Height of Six Feet. Plumbing Second Six feet of Studs.



Cut 14.—Putting up Second Section of Studs on Right; Plumbing Studs on Left.

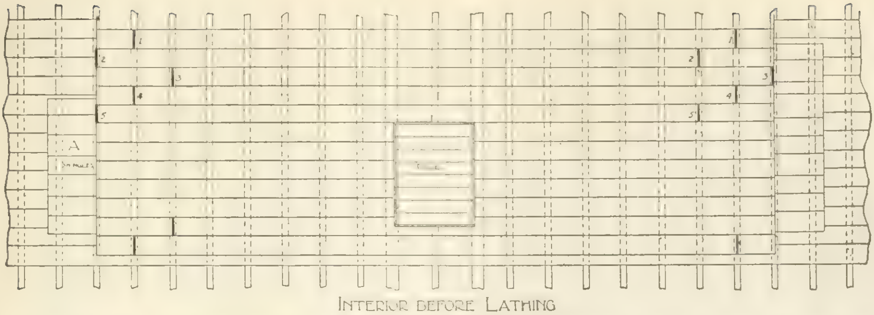


Cut 16.—Showing Construction of Door and Door Frame.

ing against the clay to resist the great outward pressure of the silage. Where the clay is solid a two-inch brick wall is quite sufficient. Three feet from the bottom and within one foot of the top of the ground the wall was thickened to eight inches and carried up six inches above the grade line. Where the grass is not kept down around the silo the brick wall should be higher to protect the wood from dampness.

When a silo is placed in the ground, unless there is good natural drainage through the subsoil, tile must be laid to drain the bottom or difficulty is almost sure to be experienced with water in the pit.

The wall of this silo should have been strengthened by imbedding an iron hoop in it just above the ground, for an eight-inch brick wall



Cut 17.—Detail of extra lining showing method of reinforcing the side of Silo in which doorways were left. Figures indicate ends of boards showing methods of breaking joints on inner lining.

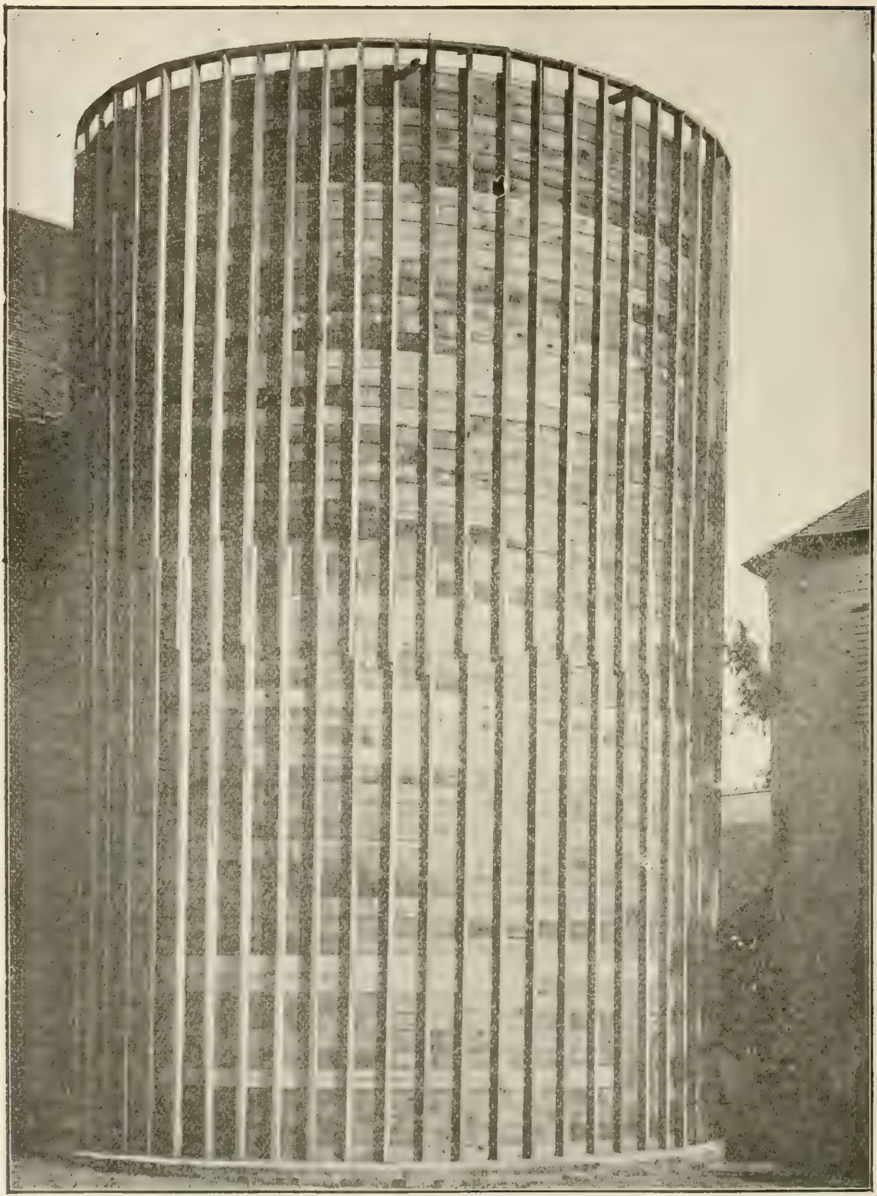
does not have sufficient strength to withstand the outward pressure of the silage at such a depth. This silo wall has cracked slightly in two or three places.

The sill was made of 2x4's cut into two foot lengths; these were thoroughly imbedded in mortar on top of the wall. The upper two feet of the wall was laid in mortar made of one part Portland cement to two parts of sharp sand, and the entire foundation was plastered with a thin coat of this mortar.

The studs, which were 16 foot 2x4's, were set on the sill and toe-nailed to it. A large post sixteen feet long was set in the ground in the center of the excavation, and boards extending from this to the studs about six feet above the foundation, held the studs perpendicular to this height. (Cut 12.) A half-inch board was then bent around the outside of the studs at his height and the studs were tacked to it as fast as they were plumbed. These boards held the studs perpendicular and in a circle to a height of six feet. The lining, which was ½x6 inches 16 feet long, made by splitting common fencing with a saw, was put on the inside, beginning at the bottom. (Cut 13.) The upper portions of the studs were then plumbed and held in place by pieces radiating from the post in the center and by boards sprung on the circumference of the silo. (Cut 13.) To insure uniform strength throughout the silo, care must be exercised to break joints when ceiling.

Staging was carried up on the inside as fast as the ceiling. When the top of the first studs was reached, the upper studs were spiked to the sides of the lower, allowing them to lap two feet, and another section was plumbed. (Cut 14.) The ceiling was continued on the inside to within six inches of the top, and the plate, which consisted of 2x4's cut into two-foot lengths, was then spiked on top of the studs. (Cut 15.)

On each side of the line of doorways were set two 2x4's spiked together to make 4x4's. These were placed so that the edge of the 2x4's faced the doorways leaving the flat side for the doors to rest against in resisting the pressure from the silage. In this way there was no crack through the 4x4's where the plaster and doors join. (Cut 16.)



Cut 15.—Inside Ceiling Completed. Condition in Which the Silo Stood for Six Weeks After Filling.

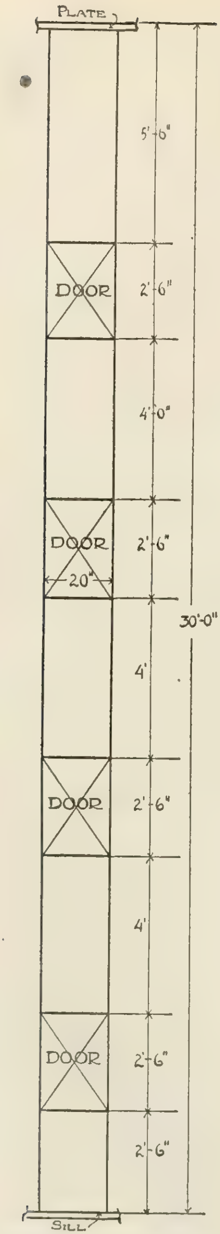
As the silo was partially cut in two on the side where the openings were left, it was necessary to reinforce it between the doors. The strongest, cheapest, and most satisfactory way to do this was to ceil that side of the silo with an extra thickness from the bottom to the top, using half-inch lumber, the same as that with which the silo was lined. The doorways were, of course, left in the middle of this extra ceiling and the spaces between the doors were thus covered with two thicknesses, with no broken joints for 14 feet, as shown in Cut 17. The ends of the boards of this inner lining broke joints on three studs so that all of the strain at the end of these boards should not come at one stud. These irregular ends were filled out with short pieces so that the edge of the extra thickness would come in a straight line. Since this inner ceiling left a jog of a half inch, the thick edge of common shingles was butted against the ends of the half-inch boards, thus running the extra thickness down to a feather-edge and making an apparently even surface on which to lath. (Cut 17.)

The silo was then lathed with common four-foot lath, breaking joints as shown in Cut 18, and nailing the lath solid to the half-inch ceiling without furring out. It is usally recommended in lathing silos that the edges of the lath be cut on a bevel so that when nailed to the wall a dove-tailed joint is formed for the mortar, or that the lath be set out on furring strips so that the mortar may clinch behind the lath. Experience shows that this is entirely unnecessary.

The plaster was made of one part Portland cement to two parts of good sharp sand. Two coats of this mortar were used making the plaster a full half-inch thick over the lath. The second coat extended continuously from the bottom of the brick work to the top of the silo, uniting the foundation and the superstructure and giving an air-tight wall for the entire silo.

Four doors were made of two thicknesses of common flooring run in opposite directions with tar paper between. These doors are each 20 inches wide, 2½ feet high, and are four feet apart. The top of the upper door is five feet below the plate, but by the time the silo is opened the silage has usually settled nearly to the top of the upper door so that but little silage has to be removed before the door can be taken out. The size and location of the four doors are shown in Cut 19 and a section of one of them in Cut 16.

Authorities on silo construction have erroneously stated that for silos 20 feet in diameter and 30 feet deep, three thicknesses of half-inch lumber are required to give sufficient strength. This silo is 30 feet in height above the foundation and as the pressure of silage at this depth is 330 pounds per square foot there is a tensile pull on the sides of the bottom foot of a silo of these dimensions of 3,300 pounds. In this lower foot to resist this strain, there are, of course, two boards each one-half inch thick and six inches wide making a total area of six square inches of lumber. On account of the great tensile strength of wood it was thought that this one layer of half-inch lumber would be sufficient to withstand the strain. To determine if this were true, the silo as shown in Cut 15 was filled and after standing six weeks did not show the slightest sign of giving in any particular.



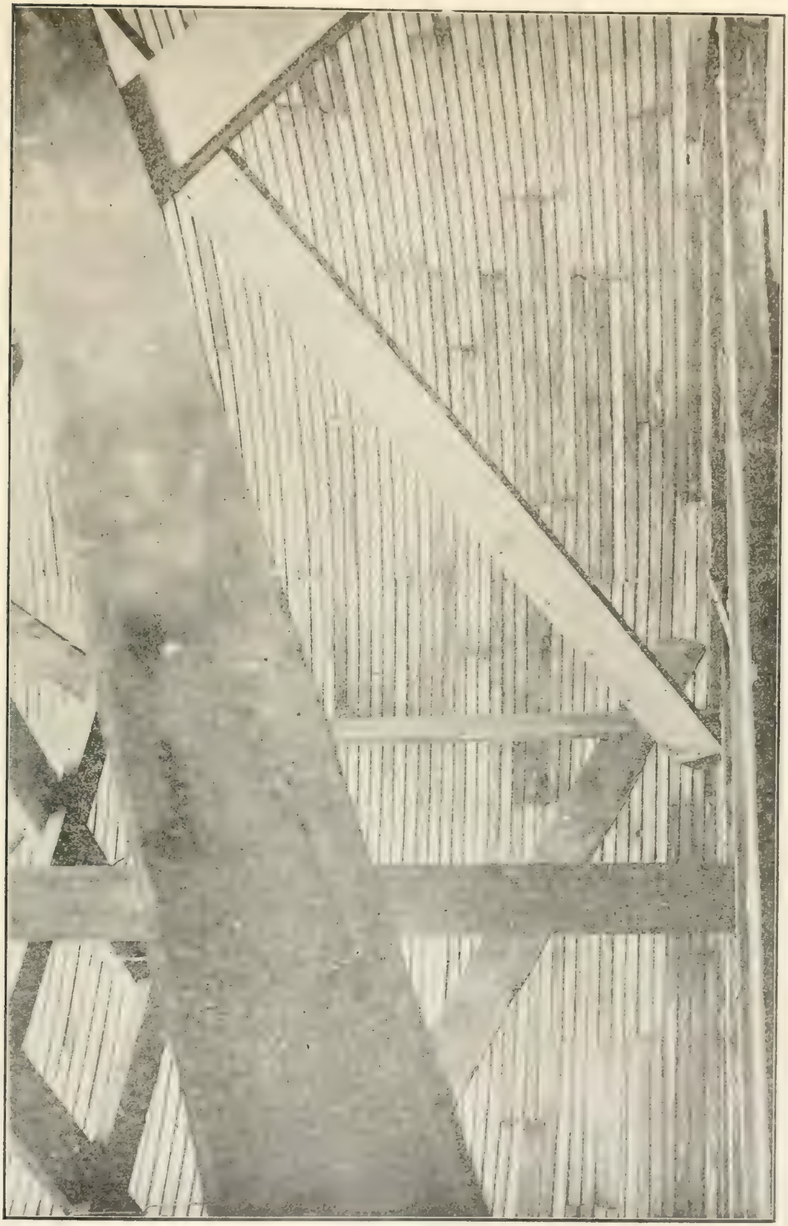
HEIGHT OF OPENINGS

(Cut 19.)

In order to preserve the silo in good condition it is absolutely necessary that the half-inch lumber with which the silo is ceiled, be protected from dampness. To this end the plaster must be of good quality and kept perfectly water-tight by cementing up any cracks that may appear, so that the wood shall receive no moisture from the silage. The wall must also be ventilated, for by allowing a free circulation of air between the sheeting and the lining, the lumber will be kept dry. In this silo a two-inch space was left at the top above the plaster and below the plate. In this way the air was allowed free access to enter from the bottom, between the outside covering and the inside lining, and pass into the silo through the openings at the top. These spaces were covered with heavy wire netting of one-third inch mesh to keep out rats and mice. (Cut 20.)

Theoretically the outside covering should be put on horizontally so that the strength of the material which forms the cover might add to the strength of the silo. There are, however, several practical difficulties in putting sheeting on in this manner. The lumber cannot be more than a half-inch thick and spring to a circle twenty feet or less in diameter, and any siding as thin as this, which is carried in stock, is practically clear lumber and necessarily high priced. Another difficulty is that the only half-inch stuff that can be purchased at the lumber yard, which will make a water-tight cover, is common house siding. This, in order to be sprung to a circle, must be rabbeted on the back side of the thick edge so as to fit over the thin edge of the board below and allow the siding to lie flat against the studs. Rabbeted siding cannot usually be obtained at a lumber yard and it is extra trouble and expense to have this work done at a mill. Another serious difficulty in putting the siding on horizontally is that at the end of each board there is a strong outward pull against the nails and as soon as the boards become slightly decayed at the ends they are likely to pull off over the nails.

Owing to these objections and to the fact that it was our aim to use, as nearly as possible, lumber that is carried in stock by all lumber yards, it was decided to put hoops on the outside and build them up of the same half-inch material



Cut 18,—Interior of Silo showing lath and staging.

as the inside sheeting. This was done by using three thicknesses and breaking joints, thus making a strong six-inch hoop 1½ inches thick. Seven of these were placed around the silo between the doors to make a continuous even surface on which to nail the sheeting. The silo was sheeted up and down with common 1x12 barn boards 14 and 16 feet long, and the cracks were covered with common three-inch battens.

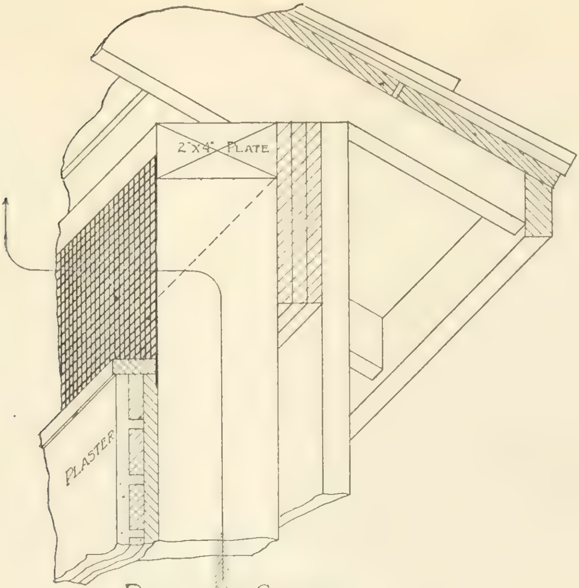
Some silos are sheeted on the outside with the same half-inch lumber as is used on the inside, having the edges cut to a bevel so that the cracks slant outward and downward. The same difficulties are encountered here, however, as were mentioned above and such siding is not perfectly water tight as the rain may drive in between the cracks When the siding is put on horizontally it should be carried up as fast as the ceiling inside, thus obvaiting the necessity of building staging on the outside.

After the silo wall was completed a conical shingled roof was put on, a chute built over the doors through which the silage is thrown down, and the small space between the silo and the barn roofed over, connecting the two. The silo was then completed ready for painting. (Cut 21.)

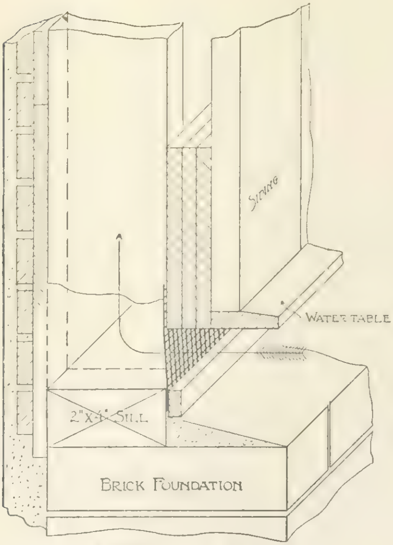
The silo has been filled twice and both years the silage has kept perfectly from the bottom to the top, even next the wall and against the doors. As before mentioned the top of the brick wall cracked, as it was not reinforced, and the silage spoiled slightly at this place, but this can easily be remedied another year.

In the spring of 1904 when the cows were turned out to pasture, about seven feet of silage remained in the silo. The small silo for summer feeding was then opened and the rotten silage from the top of the small silo was distributed over the good silage in the large silo to the depth of about six inches. This was thoroughly soaked and tramped firmly. When ready to fill again in the fall there were about eight inches of rotten silage to remove, only two inches of good silage having spoiled. Fresh corn was run on the top of this and the whole kept perfectly. When feeding out, scarcely any trace of spoiled silage was to be found at the union of the silage of the different years.

The cost of this silo, which was 20 *feet in diameter and* 34½ *feet deep, holding* 228 *tons, was* $383.00 *or* $1.68 *per ton capacity.*


2"X4" PLATE
PLASTER

DETAIL OF CORNICE


SIDING
WATER TABLE
2"X4" SILL
BRICK FOUNDATION

DETAIL OF BASE

Cut 20.—Detail at top and bottom of Silo showing system of ventilating the wall. Openings covered with wire netting to keep out rats and mice.

Itemized Cost of Silo.

Foundation—		
Excavating 4 feet deep and laying wall		
35 hours at 30 cents	$ 10.50	
70 hours at 15 cents	10.50	
2,000 brick at $7.25	14.50	
2 barrels cement at $2.00	4.00	
2 barrels lime	1.55	$ 41.05
Superstructure—		
139—2x4—16 feet, 1,482 feet at $20.00	$ 29.64	
252—½x6—16 feet, 2,016 feet at $14.00	28.22	
4 doors 20x30 inches double, 33 1-3 at $23.00	.77	
3,100 lath at $4.50 per M.	13.95	
11 barrels cement at $2.00	22.00	
6 yards sand at $1.25	7.50	
Carpenters, 67 hours at 30 cents	20.10	
Labor, 148 hours at 15 cents	22.20	
Plastering, 28 hours at 40 cents	11.20	
Tender, 35 hours at 15 cents	5.25	160.83
Sheeting—		
7 hoops—84—½x6—16 ft. 672 ft. @ $14.00	9.41	
61—1x12—16 ft. 976 ft. @ $24.00	23.42	
61—1x12—14 ft. 854 ft. @ $24.00	20.50	
61 battens ½x3—16 ft. 244 ft. @ $22.00	5.37	
61 battens ½x3—14ft. 214 ft. @ $22.00	4.70	
65 ft. 2½ in. water table @ $3.00 per C	1.95	65.35
Roof—		
18—2x4—14 ft. 168 ft. @ $19.00	3.19	
3—2x4—12 ft. 24 ft. @ $19.00	.46	
4,000 shingles @ $3.20 per M	12.80	
35 roof boards 1x6—16 ft. 280 ft. @ $16.00	4.48	
Cornice, 5—1x12—16 ft. 80 ft. @ $24.00	1.92	
Ornamental post in center	.90	23.75
Chute—		
5—2x4—14 ft. 47 ft. @ $19.00	.89	
12—1x12—16 ft. 192 ft. @ $24.00	4.61	5.50
Carpenter work on roof, sheeting of silo and chute—		
54 hours @ 30c	16.20	
120 hours @ 25c	30.00	46.20

Hardware—		
Nails		
50 lb. 8d common @ 3c	1.50	
2 lb. 10d common @ 5c	.10	
8 lb. 3d cut @ 4 c	.32	
6 lb. 6d cut @ 4c.	.24	
4 lb. shingle @ 4c	.16	
2 lb. long finishing @ 5c	.10	
Wire netting—		
63 sq. ft. 1-3 in. mesh @ 5½c	3.47	5.89
Painting—		
Priming coat,		
9 gal. oil @ 50c	4.50	
29 lb. yellow ocher @ 5c	1.45	
25 hours labor @ 15c	3.75	
Paint and labor, two cots	25.00	34.70
Total cost		383.27

Many silos are built similar to the one just described excepting that in place of the lath and cement plaster the silo is ceiled with another thickness of half-inch lumber, using water- proof paper between. That the lining shall be tight, the boards must be of the same width and it is necessary to have the lumber dressed so that the boards will be of the same thickness and will lie closely together. This makes a fairly good silo for a few years, if built of durable wood, but it is practically as expensive and does not preserve the silage so thoroughly.

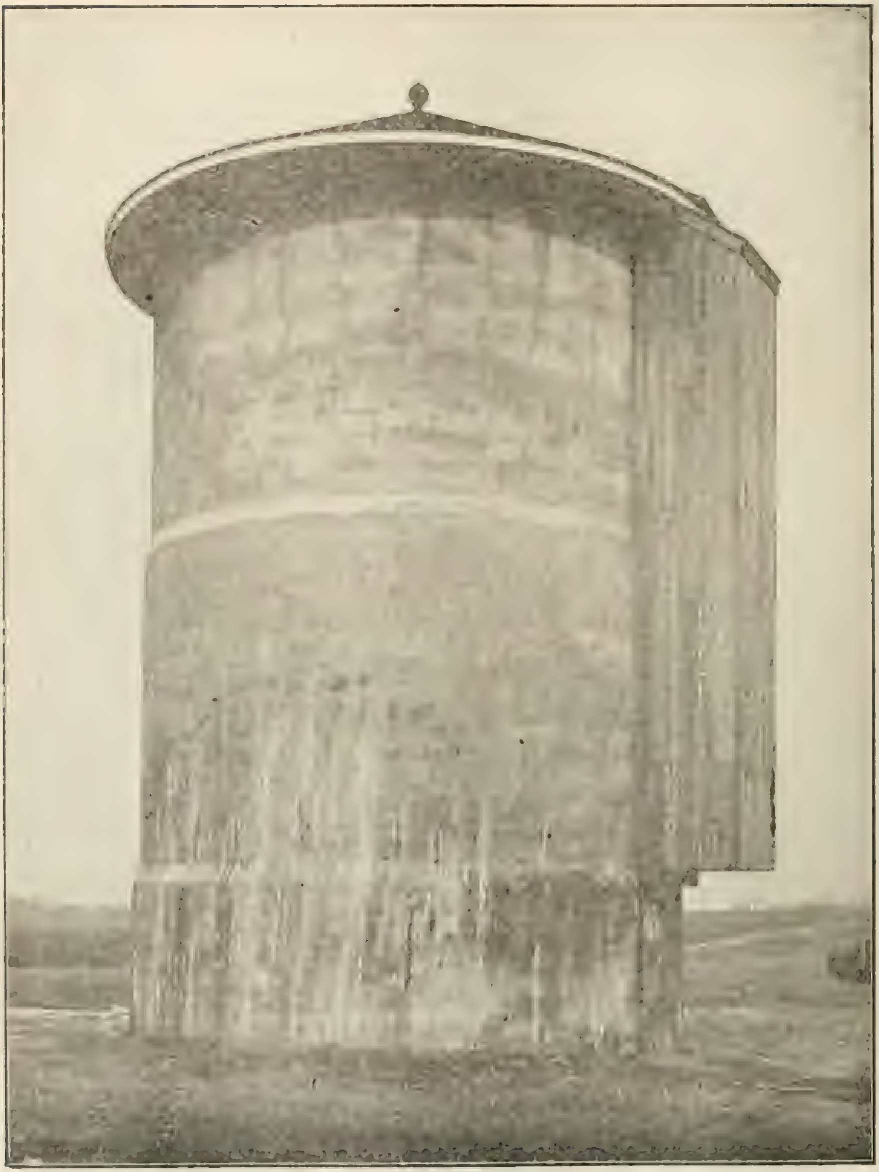
The exterior covering of this style of silo may be the same as for a plastered silo. If built inside the barn no roof or outer sheeting is neccesary.

From what we now know, the round wood silo plastered with cement seems to be the new best construction, but the indications are that when we learn to handle concrete to the best advantage this will be the material for building silos.

CONCRETE SILOS.

Silos built of concrete have been 30 feet deep with the wall not more than six inches thick at the base and tapering to four inches at the top. Where gravel or crushed stone can be obtained at a reasonable price it may be advisable to make the walls slightly thicker, and in cold climates they should be built with a dead-air space in the wall to prevent the silage from freezing. In any event there should be enough heavy wire or iron rods imbedded in the wall to withstand the strain of the silage; unless this is done cracks are likely to appear. The amount of wire necessary in each case will depend upon the size and depth of the silo. The wall should be plastered on the inside with one part of Portland cement to two of good sharp sand troweled to a smooth surface. This will resist the action of the acid in the silage.

Cut 28 shows an all-concrete silo 20 feet in diameter and 42 feet deep. The wall is 22 inches thick for the first 14 feet, 19 inches thick



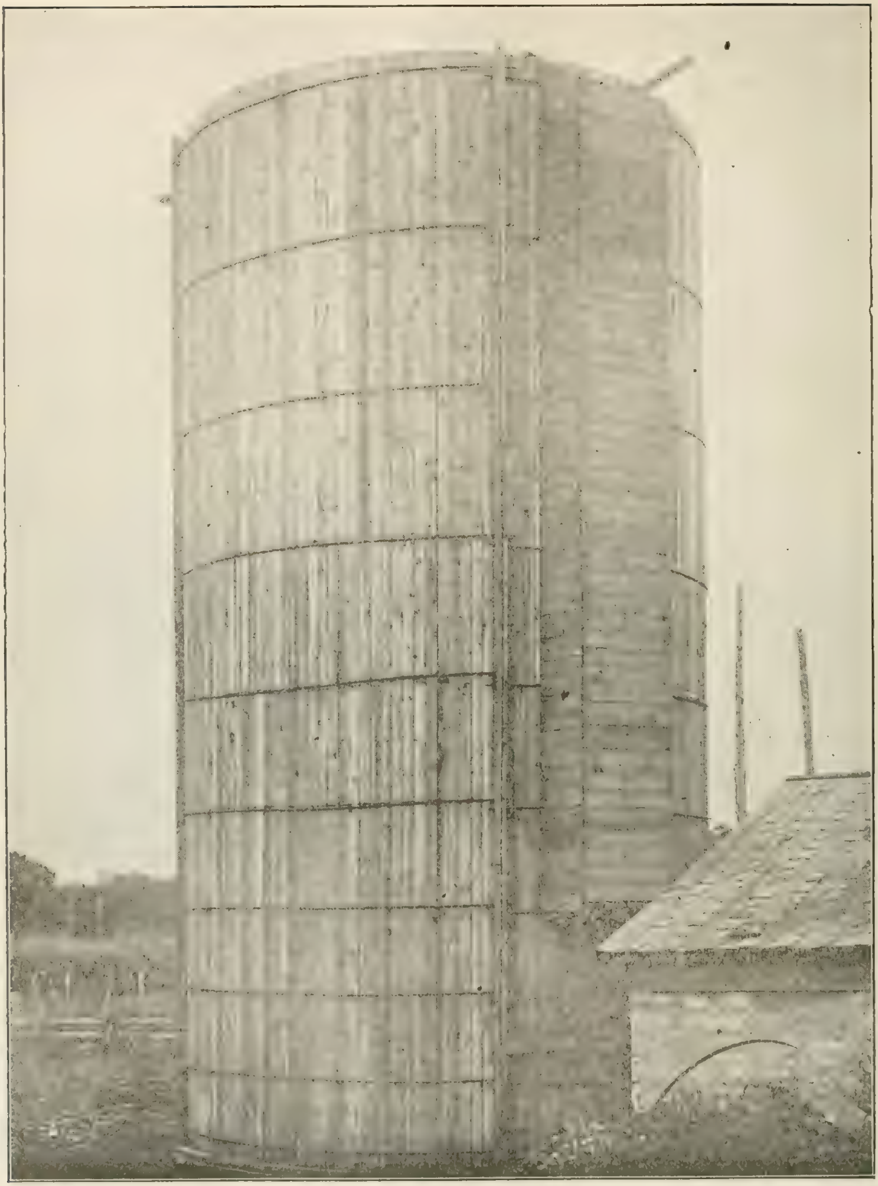
Cut 28.—Concrete Silo 20 feet in diameter and 42 feet deep; capacity 334 tons.

the next 14 feet, and 16 inches thick the upper 14 feet. This silo cost approximately $1200, and as it holds 334 tons, the cost per ton was $3.59. While the first cost of this silo was high it may prove economical in the end as it should stand for more than a hundred years.

It is essential that a concrete, stone, or brick silo have a good foundation, otherwise it is likely to settle unevenly and cracks will appear in the wall, giving the air a chance to enter. If the silo is put at least three feet into the ground this assures a firm footing and also adds to the depth of the structure.

There are great possibilities in reinforced concrete and a circular structure is the best to be easily reinforced. Silos have been built of concrete but usually with solid walls and much thicker than necessary.

Cut 30.—Stone Silo 18 feet 10 inches in diameter and 30 feet deep; capacity 156 tons. Cost about $600..



Cut 32.—Stave Silo without roof, 16 feet in diameter and 34 feet deep; capacity 150 tons. To be recommended only where a temporary Silo is desired.

The method of construction heretofore has in most cases been cumbersome, requiring a large amount of lumber to construct the forms.

BRICK SILOS.

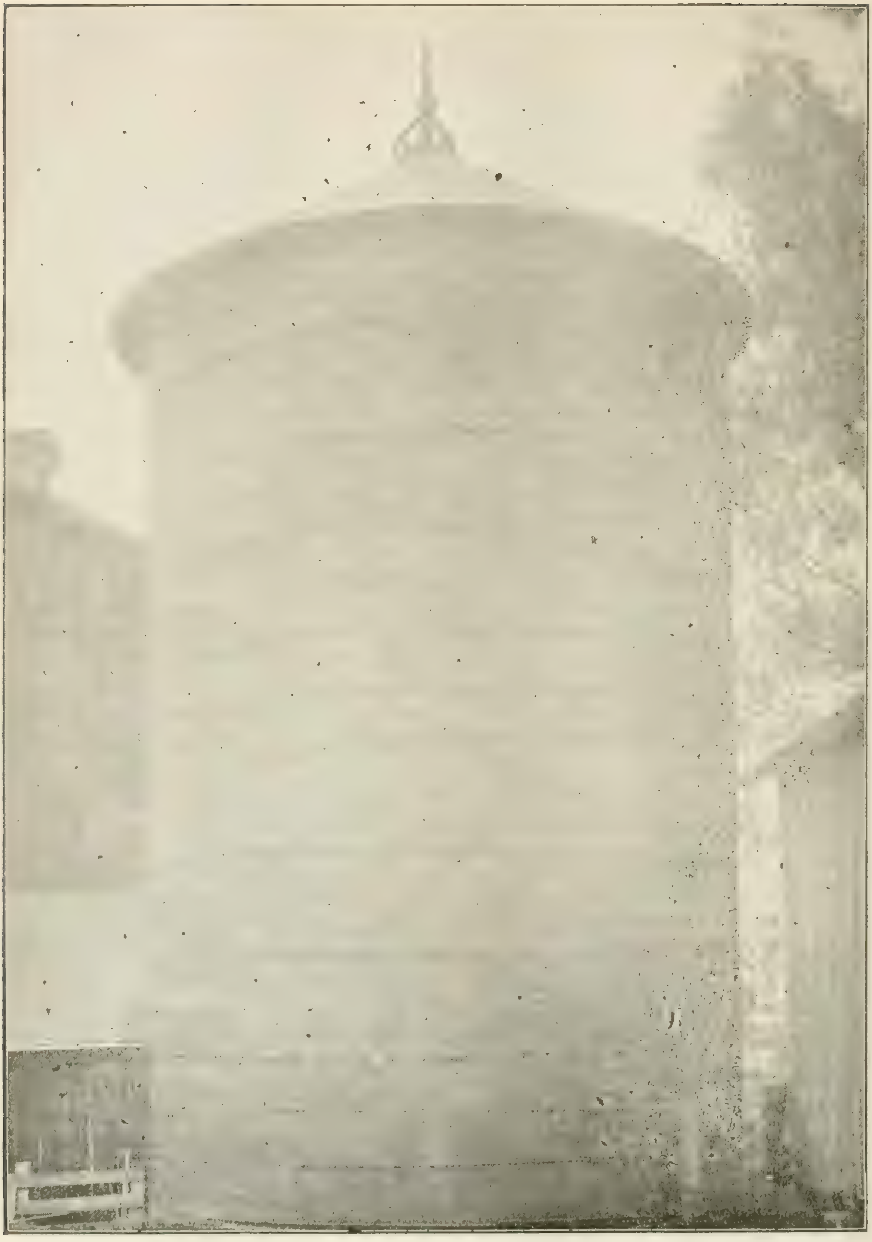
Where brick is cheap and stone and gravel scarce, a brick silo may be the most economical. In large brick silos the wall is usually built with three or four courses of brick at the base and made a course thinner at various heights until reaching the upper ten feet, which need not be more than eight inches thick. The silo rests upon a seven-foot stone foundation 18 inches thick; six feet of it being below the ground. Upon this are laid three courses of brick, the middle course being of brick tile which contains a dead-air space and thus prevents freeing to a great extent. This wall extends twelve feet above the foundation and from that point to the top, two courses of brick are used with one and a half inch air space between. One silo 16feet in diameter and 30 feet deep, built in this manner, holds 120 tons and costs $250, or $2.08 perton. Anothersilo of the same depth and 19 feet in diameter holds 168 tons and cost $350, or $2.08 per ton, the same as the smaller silo.

STAVE SILOS.

There are cases where a cheap, temporary silo may be economical and of great advantage, for example, a farmer may expect to build a new barn in a different place and want a silo near the old barn for a few years only; or a renter may wish a temporary silo and then if he moves in a short time he can take the lumber from a stave silo with him.

The objections to a stave silo are that the staves shrink during dry weather when the silo is empty and unless the hoops are tightened there is a possibility of the silo being racked or blown over. If the hoops are tightened when the staves are dry, there is then danger of the hoops bursting when the silo is filled and the staves again become saturated with moisture. An example of this came under the writer's notice recently when the second morning after a silo was filled, the owner found half the hoops had burst. It will be noticed in the illustrations of stave silos that where they had been put up for any length of time the staves had shrunk allowing the hoops to drop from their original position. A stave silo is usually much more satisfactory if a building is built over it for protection, but this makes it expensive.

Cut 32 shows a stave silo recently built. This silo is 16 feet in diameter, 34 feet deep, and has a capacity of 150 tons. The foundation, which extends two feet into the ground, is a brick wall that was laid up by the owner. The silo was built by two carpenters in nine days at $2.50 a day each, making $45 paid out for labor. The lumber cost $80, the iron hoops $20, and nails and spikes $2. There being no roof the silo above the foundation cost, including labor, $147. If the brick had been purchased and the labor of excavating for the foundation and laying the brick charged for, the total cost of the silo would have been approximately $170 without a roof, or $1.13 per ton.



Cut 33.—Stave Silo 25 feet in diameter and 34 feet deep; capacity 224 tons. The staves have shrunk when empty allowing hoops to drop from original position.

The staves were rough white pine, 2x4, 14 and 18 feet long to make the required height. Four 4x6 uprights were placed on the foundation in the circle 90 degrees apart, holes having been bored in them to receive the iron hoops which had threads cut on the ends. The staves were then set in the circle alternating in length so as to break joints. As each 2x4 was set up it was fastened to the next one by means of six inch spikes which were driven through the 2x4's edgewise. Spiking in this way makes the silo much more rigid and it is not so likely to be racked or blown down when empty. When all the staves were in place the silo was tightened by turning up the nuts at the ends of the iron hoops on either side of the 4x6's. The hoops are much closer together at the bottom than at the top to give the added strength necessary where the pressure is the greatest.

Four doors 18 inches wide and two feet high were cut in the side, one above the other, about six feet apart. Outside of these was built a chute to prevent the silage from being blown away when thrown down.

There are several firms who manufacture stave silos and send them out in any size desired, ready to set up. Many of these are made of durable wood and give good satisfaction. One of these silos is illustrated in Cut 33.

While it is true that a stave silo may be used to advantage in some cases, yet where a permanent silo is desired either the wood silo plastered with cement, or the grout, or brick structure will undoubtedly prove most satisfactory, both on account of greater permanency and the better preservation of the silage.

THE SILO AS A FACTOR IN ECONOMICAL FEEDING.

BY HON. JOHN PATTERSON, KIRKSVILLE, MO.

The economy in feeding cows is not saving feed, for the more you can get her to eat and digest, the more she will make for her keeper. When I think of that I remember what the Swedish dairyman said: "If I feed a half gallon of barley a day, I get nothing for it; she needs that for her own support. But if I feed a whole gallon, she gives enough more to pay double for it." That means if you feed little, you lose the value of that, but if you feed generously she makes you a profit. That is, she ought to have all she can eat and digest properly. Besides feed, she must be kept in a comfortable place so as not to be exposed to storms, rain and snow; she must be handled by folks that know how to be good to a cow. There are some men that it is not possible to learn that. They will roar, swear and beat her for awkwardness and roughness of their own, where a man that would be gentle and kind would have no trouble.

The first thing is the procuring of feed. I take it that the dairyman is a farmer and runs his farm to produce dairy products. Then he wants to raise as nearly as possible all the feed on the farm. He has it before him to consider what to raise that will make most, best and cheapest feed. I think I have studied all parts of the known world for all the different plants to find something good and very productive. I have tried nearly all the new things, such as Pencelaria, sunflower, vetches, sugar cane, cow peas and clovers, and, of course, our greatest of all feeds, the common corn. I say *greatest* because I think it is best and yields more per acre. But the common way of letting it get dry and hard, then gathering only the ears, grinding or feeding whole, is not the best. When I first begun dairying I would cut and shuck it, run it through a cutting machine that mixed the corn with the fodder and two to four pounds of bran. I thought I did as well as I could to get the most benefit of the corn, but that left a great deal of corn stalks they would not eat with sufficient amount of clover hay that was fairly good.

Next I raised cow peas and built silos, cut the corn when it was somewhat green and the corn a little too hard for roasting ears. I mixed corn and cow peas, one load of peas to two of corn. That makes an ensilage that cows will eat better than corn alone. But the ground I had in peas did not produce more than one-third as much feed as good corn. So I think corn pays best because you get the most, and with good clover hay and plenty of ensilage, you get something near a good ration. But for full flow of milk it needs something of what corn lacks mixed with ensilage. This time oats were a good crop and cheaper than bran. A few pounds, say three to six pounds, mixed in the ensilage, seems to give good results. Don't need to grind oats when mixing with ensilage, as the cow will grind it good when mixed with something she has to chew.

When I speak of the economy of putting corn in silos to feed cows, I don't mean it is good for cows only—it is good for all kinds of stock. All seem to like it and thrive on it, and when you get building and machinery for it, it don't cost any more to put it in silos than to cut, shock, etc., and it is much more convenient to feed in barns or sheds, where stock can be kept comfortable and all the manure can be saved. That subject will need more and more to be considered. Our lands are showing the need of it, and when applied they make great increase in production. I think it belongs to good farming to make and apply fertilizers as well as to cultivate good.

ENSILAGE YIELDS RICH FERTILIZER.

There is a subject in this that I have never heard mentioned: that any plant cut at the best time for making good feed is also the best time to make good fertilizer, and that corn stalks left standing until they are dead and weather-beaten have nearly no fertilizing quality in them, and other vegetation the same way. I can not tell where it goes to, only I don't think they are any benefit to land. That makes me think corn put in silos makes more valuable fertilizer than dried stuff and frosted and weather-beaten vegetation. I think silos are sure to come into general use, although the farmers who only aim to raise beef are very slow to turn to it. It seems too costly to build silos and buy cutting machines, etc., but that will be changed. I look for this way of making artificial rock out of sand and gravel, and cement will be the material for building. Such will be air and water tight, and that is the essential in a silo. The machinery will soon be gotten by those who run threshing outfits. the machine is on wheels and can be folded and set up and taken down quicker than a threshing machine.

Some experiment station publish finding 45 per cent of the food value of the corn was in the stalk, leaves, husk and tassel. That is nearly as much as the corn, and when put in silos at the right time it will all be eaten and be good food, and I don't know any way to handle corn so it will be eaten so well. So I think it good policy to work the corn crop into the silo, and they that don't do that allow themselves to suffer big loss that could well be prevented.

NECESSITY FOR GOOD COWS.

I can hardly stop till I say something about the necessity of good cows, as almost all farmers will fool away valuable time and fed with what they call "all-purpose" cows, thinking they must have a sort that will bring a steer calf that the feeder and butcher will have. Try to get cows that will produce good quality and quantity of milk. Never mind the steer calves if you aim to make on dairy products. If you feed them well you can make them good to butcher when a month to twelve months old, even if he is Jersey steer, and the heifers should be raised for cows. If you get heifer calves from unprofitable cows, use them the same as the steer calves.

THE SILO ON THE FARM.

CHAS LAU. R. F. D. NO. 4, DAVENPORT, IA., BEFORE SCOTT COUNTY FARMERS' INSTITUTE.

When land values have reached the hundred dollar mark, and over, the farmer is forced up against the serious proposition what to do, to make the returns for his farm represent a resonable dividend on the capital invested. Though land values may rise somewhat higher, there is no prospect that crops will be larger or prices than what they have been in recent years, known as years of prosperity. With still lower prices or smaller crops, or both, investemnt and dividends will still grow more out of proportion and farming will become discouraging as a financial enterprise. In the face of such discouraging possibillities at any time in the future, what can be done to restore farming to a reasonable interest paying basis? I will answer. We must and we will do what peasants of older countries on much higher priced land are doing; farm more intensively—*farm better.* Not only must we guard against habitual wastefulness by stuffing up all the leaks. Not only must we introduce all labor saving implements and four horse machinery to curtail the exorbitant wages. Not only must we economize improve all along the line in the matter of seed-selection, cultivation, care of live-stock, fertility of soil etc, but we must likewise be awake to the adaption of such new methods and systems as evolution in progressive farming will from time to time advance. By this I do not mean that we as farmers shall hastily grasp at every new fangled scheme sprung upon an unsuspecting community as though it was a genuine gold brick, but adapt s uohchanges as command themselves to a careful and unpreducjiceded judgment and of such, I contend is the silo on the farm.

DOES IT PAY.

The first question in this as in all enterprises is *does it pay?* If my memory serves me right—we were told a year ago on this very platform by State Dairy commissioner, Wright, that where ordinarily on the farm it required three acres to keep a milk-cow, with a silo it requires but one. This statement in another form would mean, where you are keeping 30 head of cattle, now, with the aid of a silo you can keep 90. In other words as soon as your silo is filled you can plow up two-thirds of your meadows and pasture and plant it to potatoes or corn. Such are the possibilities of the silo as presented to you by the best authority in the state and he certainly knows what he is talking about. Assuming that his statements are correct in fact, can there be any doubt as to the profitableness of the silo on the farm? Ensilage feeding has long passed its experimental stage and no where in print, or by word do we notice a single word of objection raised to it, while all trials at experiment stations give unqualified endorsement to the feeding of corn—silage. No one would deny the benefits of feeding beets to cattle in winter, yet the Government Bulletine No. 22 reports slightly better results from corn—silage than beets say nothing of the far greater cost of producing beets. All opposition and objections urged against silage feeding in its early stages, and in a measure justified by the blunders committed by unexperienced as is the case with most ventures in their infancy, have gradually been over come today the Borden Condensed Milk Co. that once ruled out ensilage as an objectionable feed for its products, today issues pamphlets with instructions to its patrons how to build silos and handle corn for the best results in silage feeding. The Kalamazoo Silo and Tank Co. one of a half dozen concerns has shipped 2800 Silos to various parts of U. S. mostly to Wisconsin, Michigan, Illinois and Minnesota, with a rapid increase in the demand. The silo by virture of its great merits is gradually working out its own salvation and this without any promoters to boom its introduction for financial gain, for their is no patent on ensilage as there is on stockfoods.

WHAT IS ENSILAGE?

Ensilage or Silage is corn, clover, grass, beets or any greens succulent crop cut up with an ordinary feed cutter and hoisted into air tight tank called a silo, where it will heat up to 180 degrees, ferment and produce carbonic acid gas, which with the exclusion of oxygen will preserve the green feed indefinitely. It comes out, moist, slightly discolored with a sweet-sour taste odor and often warm. It has been known to keep seven years in condition without spoiling. I have myself fed ensilarge three years old which was perfectly preserved. Corn silage is greatly relished by, all farm animals including hogs, sheep and poultry. Although a rich succulent and palatable feed that goes well with, and greatly helps the perfect assimilation and digestion of other farm feeds, corn silage is not a well balanced feed in its self and should not be fed exclusively, being too long in carbohydrates and too short in protein. Its protein contents are only two and one-fifth per cent, about half of what green clover and bluegrass represents. Never the less the importance of the natural juices in the digestive functions and healths of the farm animals can never be satisfactorily demonstrated by labatory analyses. We all know as farmers by experience how grass will put life and gloss and health to our cattle, how it will round out and make a hog of the runt that was too measly to go with the fat lot. Just as vegetables, fruits and so called condemental foods are indespensable for the health of the human family, so are they likewise necessary for the thrift of live stock, that often are carried six months in the year on dry feed. This is a severe test for animals that are naturally rumanants and habitually brouse on juicy feed, no wonder they emerege from this ordeal and this period of badly balanced rations, as wrecks of their former selves, thin in flesh, and rough in hair, scrambling for the first green blade of grass. The silo will in a great measure counteract this great deficiency of the dry food season and it forms the connecting link between the end and beginning of the grass period. Moreover there will be less trouble in the stable at calving time, less abortion, less retention of after-birth less of such difficulties as befall animals that are out of condition.

CLOVER VS. ENSILAGE.

You will answer that clover hay will remedy all these troubles. I admit the great advantages of clover to hay balance up corn and to promote the general health of life stock, but there are serious obstacles in the way of a clover hay crop not common to a silage crop. In this lattitude only one year in three can be put down as a clover year, not always can we get a perfect stand, nor is the weather always settled in June to cure it in the best shape. Nevertheless in the face of all these difficulties we are justified in using our extreme efforts to secure a crop of clover, and if possible have storage capacity enough to let the year of plenty carry us over the year of shortage. With clover hay added to ensilage and corn we are placed in possession of a variety and kind of feed that will place all farm animals in prime condition of health and thrift. The question should not be ensilage *or* clover, but ensilage *and* clover.

WASTE OF CORN CROP.

I have spoken against waste on the farm. It is now a pretty well settled fact, that of the total nourishment at one time represented in the corn plant only 60 per cent is utilized by confining ourselves to the ear and letting the stalk with its 40 per cent go to waste, like hay becoming over ripe. This is a serious loss and would be amazing if presented to us in dollars and cents. The silo again comes in here as the quickest and speediest solution of this difficulty. The whole plant excepting the roots, when the corn is in the glazed or nearly matured condition, wanders into the pit ½inch pieces, again to come out tasting all alike, (good), fed under cover in convenient distance to the cattle, no waste by leaching rains or bleaching suns, no moulding in the centre of the shock no refuse in the manger, beets and tassel, pith and corn all devoured with a keen appetite. Ensilage is the cheapest and most satisfactory feed on the farm. At the rate of 12 to 20 tons per acre of corn 1 acre would keep a cow from 600 to a 1000 days, feeding 40 lbs. per day. The Silo was long supposed to be only the dairy man's accesory for he more than any other realized the importance of succulant feed to keep his milk cows flush, but in recent years much light has been shed on the subject—by the test at experiment stations,—an dit was found what would produce milk would *also* produce beef and gradually the silo is working its way into the corn belt region to help the western feeder to produce cheaper beef. From first a winter feed, it has next become a summer feed during grass shortage, and next an all year around feed. Hoard's Dairy-man advocated the feeding of silage every day of the year. In the Dakotas, where the maturing corn is an uncertain proposition the silo can be made a saving factor, like wise in Kansas where a withering wind in August works havoc with a promising crop, there will be ample juice left in the stalks to make good silage for winter feed. The corn crop when frozen makes good silage if worked up immediately.

A PLEA FOR BOSSIE.

With dairy products high in price and ever tending higher, with future interurban facilities for quick transportation of dairy products to cities, with increase consumption corresponding to increase population, with the process of making milk flour an established success there can not be otherwise but a flattering future for the man that keeps milk-cows. Bossie who has been the steadfast friend and provider of man for centuries, has lost none of her prestige and is as indespensable on a well regulated farm as she ever has been. All dairy sections whether on poor soil or rich showsigns of thrift and prosperity through the generosity of Bossie when she is cared for and held in high esteem. Give unto her and she will respond bountifully with the most wholesome fluid that was ever fed to man or beast, she will restore fertility to the soil and replenish the farmer's purse. She is an all around useful and indispensable creature in farm operations and to attempt farming without her and her progney would be a short sighted policy; would be soil robbery which leads to agricultural bankruptcy. Where ten cows or even less are the silo becomes a paying investment. A census taken in Fand DuLac Co. Mich., where milk was furnished a creamery, cows *not* fed on corn silage netted only $4.00 per heard, while those which were fed on corn silage netted $21.02 per cow.

In Wisconsin and Michigan the silo has come to be regarded as an absolute necessity for the dairy cow.

PROTEIN IN THE SILO.

I have stated that corn silage was not a perfectly balanced feed, being short in protien, the flesh former. How can we get succulent protein into the silo and secure the most perfect feed imaginable and make us still more independant of clover. Of all the legumes or nitrogenous plants the soy-beam, which ranks with alfalfa in protein contents, is best adapted for cutting up with corn into the silo, it grows erect, yields abaut as much as corn, can be cut and bound with a corn binder and matures with corn. Humphrey Jones of Indiana raises from 150 to 250 acres of soy-beans, the greater part of which is cut up with corn into the silo at the rate of one load of soy-bean to three of corn. This gentleman has tested no less than a dozen varieties of soy-beans and prefers the medium black as the best kind suited with corn silage. My own efforts with soy-beans have been disappointing, the first planting with the corn in the hill was too early a variety, maturing too far ahead of the corn. My second planting last year proved to be worthless seed and did not grow.—This year I shall renew my attempts with several varieties of the late type. There is no question in my mind but what the silo will be a necessary adjunct in the future to every well managed farm and once being established it might as well be filled with a wholesome, well balanced delicious food for the livestock.

SILOS AND SILAGE.

W. E. BROWN, BEFORE LEE COUNTY FARMERS' INSTITUTE.

A silo is, or may be a tank, pit or place prepared for the storage and treatment of green plant food, such as Corn, Clover, Sorgum, Alfalfa, and other green products of our fields, thereby retaining a degree of their natural juices and moisture, in palatable from for future use as food for domestic animals.

Ensilage means, the storing and treatment of green fodder or plants, in a silo for use as before stated.

Silage is the substance or product so treated.

We will take up for our first consideration the finished product, Silage; It is one thing to preach, It is another thing to practice. The Gospel of Silage as an economical stock food has been preached, like many other Gospels, for more than two decades, and like the other Gospels, not wholly disbelieved, but slowly to be accepted.

It is the wonder of the "true believer", in the various Gospels that any and all who come to the knowledge of their teaching, do not at once accept and put into practice, and receive the blessings they offer. With some of these Gospels the reward seems rather remote, too much on the plan of the Life Insurance Deferred Dividends, that we are hearing so much about just now.

But in the Gospel we now have under consideration, we got quick returns, a dividends semi-annually, as we will show further on.

There are numerous crops that may be ensilaged, but the one crop that surpasses all others for silage is corn. The books say that 40 per cent of the nutrients contained in the corn plant, are found in other, than the grain it produces.

Now if a manufacturer producing a certain commodity, finds 40 per cent of his crude material is waste, so far as his finished product is concerned, he studies carefully what may be done to utilize the waste. This waste when it can be turned to some account, they call a by-product. Now suppose that one manufacturer would discover a means of converting what had previously been a waste, to a product, almost equal in value to his original finished product, how long do you suppose that it would take his competitors to adopt similar methods? Yet we farmers do allow such waste to continue when we are convinced that such is the case, and know just what to do to turn it to account.

In the factory man, this utilization of their waste or by product is called business method, saving that which formerly wasted is "Business" good Business. Now let us begin to apply some of the advise laid down by Mr. Pollard yesterday.

The statement that 40 per cent of the digestable nutrients found in the corn plant, at maturity as demonstrated by our experiment stations, is contained in the other elements of the corn plant, besides the grain is no doubt correct.

Granting this to be true, it is a poor business proposition to allow such an amount of value to go to waste, when there is a logical method of saving it. The silo offers the remedy. You all well know that in the ordinary way of harvesting our corn by husking it in the field, leaves nothing of value save the ears of corn that are overlooked, what remains is a delusion. I am aware that it would not be practicable to harvest our whole corn crop into silo, but in view of the fact that silage fed cattle have a sharp appetite for dry roughage your shock corn or husked fodder supplies this want admirably.

Among the greatest advantages in the use of silage as a stock food is its palatability and wholesomeness. It is not only nutritious but I find it to be a good conditioner.

Any feeder using silage as a basis for compounding a feed ration need never spend money for stock foods, as cattle fed upon it, are uniformly bright eyed, loose hided and mellow. I have never fattened steers, but nothing what our dry cows and youngsters do on silage and clover with little or no grain. I believe the statement of feeders who claim that *allowing* 10 per cent for the grain found in good silage they are able to produce as much gain per day on feeders, with *one half* the amount of grain where silage forms the basis of their rations, as they can with the other usual combinations of grain and roughage with the *silage* left out. This is a pretty broad statement and is too good to pass unheeded, if only half true. My experience with silage has been in connection with the *Dairy*. As a milk proposition I know that I have an advantage over any dairyman who attempt to produce milk without silage. My cows speak for themselves, as many farmers here today who pass over our places and see the health robust condition of our stock, young and old can testify, and I see no reason why silage would not work the same advantage for the feeder as the dairyman.

There are others advantages that follow the ensilage practice, one of which is, that you remove your crop from the ground so that it can be plowed in the fall, a practice I have followed for years. All of the ground that we intend to put in small grain or corn this Spring was plowed *late* last Fall. I find that this treatment of our light clay soil prevents water standing on top of the ground and we are able to plant our oats many days before we could get into corn stock ground to mud them in as of old. I also believe that late fall plowing destroys a great many insects that otherwise winter in the ground if not distrubed.

In preparing crops for the silo we have adopted the practice of drilling our corn, dropping one kernel every eight to twelve inches. We find we get a greater growth of fodder with good ears. Good corn does not hurt silage. The ideal time to ensilage corn is just when the kernels of the well developed ears are well dented. Another good rule is when the two bottom leaves begin to turn yellow, or when you would consider it in good condition to put into shock. The best silage is made from corn that is fully matured but has not begun to dry up. I have used sorgum with good results. Cattle are extremely fond of it. It is best however to mix it with your corn.

I think our best results came from planting cane seed with planter, going over the ground following the corn rows. In cultivating we paid little attention to the cane but it made quite a stand among the corn. This silage was greatly relished by all of our stock.

FEEDING SILAGE TO BEEF CATTLE.

HUMPHREY JONES, FAYETTE COUNTY, ILLINOIS, IN WALLACE'S FARMER.

Cattle feeders everywhere realize the importance of the cheaper production of beef. The profit usually are small and often times there is a loss. Assuming that the law of supply and demand controls the price of the finished product, there appears to be but two ways to increase the profits of the feeder—to get the feeders cheaper, or to reduce the cost of finishing the steers.

The use of silage for steer feeding is a new thing, and, like all new things, it is apt to have its too enthusiastic advocates who will make extravagant and excessive claims for it. The subject should be discussed and considered impartially and not after the fashion of the special pleader or the advocate of some pet theory. The testimony of those having had experience on the subject, to be of much value, should be full and complete—the whole truth— because a partial statement of facts in regard to any matter may be as misleading as an absolute misstatement.

Our experience with silage for cattle feeding purposes was begun in 1901, at which time we erected and filled three silos 26x42 feet, having a capacity of about 550 to 600 tons each. This was followed the next year by the erection of a cement silo 36x52 feet, which, according to the rules usually applied to ascertain the capacity of silos of ordinary size, should hold about 1,500 tons, but we have found that it actually holds about 50 per cent more than all three of our other silos put together, which, figured acording to the same rules, have the capacities above given, so that our cement silo must hold something over 2,000 tons. The contents of these silos have each year been fed to beef cattle. Our silage has been made of ripe corn grown so as to make the largest possible yield of grain and nearly ripe soy beans mixed in the silo in the proprotion of about three-fourths of the former to to one-fourth of the latter. In connection with the silage we have fed clover, alfalfa, and oats hay Early in our experience we added ear corn, but soon abandoned that and substituted cotton seed meal therefor, with much better and more satisfactory results.

We find that cattle will eat of the kind of silage we have been making about 50 pounds per day per hundred weight up to 1,000 pounds weight; 50 pounds per head per day being about the maximum amount which a steer of any size will eat; that when one-half of a pound per hundredweight of cotton seed meal is sprinkled over the silage the cattle will eat slightly above one-third of a pound per hundred weight per day of clover, alfalfa, or oat hay, making for a 1,000-pound steer a ration of 50 pounds silage, 5 pounds cotton seed meal, and 4 pounds of hay, and for smaller steers proportionate amounts less. In our later feeding operations we have settled upon this kind of a ration for fattening cattle. Cattle which are being carried as stockers we feed little or no cotton seed meal, and they eat a larger proportion of clover hay, probably 50 per cent more. Fifty pounds of corn and soy-bean silage, 5 pounds cotton seed meal, and 4 pounds clover or alfalfa hay for a 1,000-pound steer makes a ration containing about 2.8 pounds protein, 13 punds carbohydrates, and 1.2 pounds fat, with a nutritive ratio of about 1 to 5.5. The standard ration is: Protein, 2.51 pounds; carbohydrates, 15 pounds; and fat, 5 pounds. Nutritive ratio about 1 to 6, so that it will be seen that the ration closely approximates what is thought to be the actual requirements of the steer. Whatever the correct theory may be we know from actual experience that the above ration makes the cattle do better and makes more money for the feed consumed than our former practice of feeding the cattle all the shock corn they would eat with occasional allowances of clover hay, or ear corn and clover hay. The steers with this ration, get about 15 pounds of grain per head per day, or about 1½ pounds per hundred weight for a 1,000-pound steer. Professor Henry states that about 12 pounds per day of grain is all a steer of any size can profitably utilize, and he cites the fact that the best English and Scotch feeders use even less than the amount of grain. We have found by pretty careful tests that corn grown as we grow it for silage, that will yield fifty bushels of ears, will make about eight tons of silage as taken from the silo, there of course being a greater weight as it goes into the silo. If the corn were cut green according to the practice of many dairymen it would make probably ten to twelve tons per acre, but we always let our corn get ripe enough to put in shock, and much of it becomes dead ripe before going into the silos. Fifty bushels of ears equals 3,500 pounds of ears for each 16,000 pounds of silage, which makes the ears equal about 22 per cent of the total weight of silage. The soy beans, we think, have about the same proportion of grain to total weight, so that we count our silage 20 per cent grain. In 50 pounds of silage a steer would therefore get 10 pounds of grain, and 5 pounds of cotton seed meal added would make 15 pounds of grain, or 1½ pounds per hundredweight for a 1,000-pound steer. An important feature, too, is the fact that the grain is thoroughly mixed with the roughage so that it is all well digesed, thus making a smaller grain ration sufficient.

Whether silage, in the case of any particular feeder, should be adopted for steer feeding, dpeends upon the net balance of advantages and disadvantages in his special situation and circumstances. Not all men, by any means, who handle cattle should build silos.

The advantages, as we have found them, are substantially as follows:

First—Corn put into the silo has a greater feeding value than when fed dry.

Siloing does not increase the food content of the corn. You cannot take any more out of the silo than you put in, nor as much, but the increase in digestibility of the whole plant by reason of the heating and fermentation incident to siloing exceeds the loss of food value due to that process (and there is some), so that there is a net gain. This gain is not much, running, according to the experiments made at several of the stations, about 10 to 12 per cent. This is not enough in and of itself to justify ensiloing the corn; but it must be remembered that these experiments have all been conducted upon the basis of the dry corn plant being cared for so as to lose as little as possible of its feed value and palability, and that it has been prepared and fed in the best possible condition for the cattle to get the largest benefit therefrom. This renders these experiments of little practical value to the average cattle feeder, because he has not such means of caring for the dry corn plant as is usually employed in making these experiments. With three-fourths of the feeders in the principal cattle feeding sections of Ohio shock corn only is fed, and the corn stands out in the field all winter and is hauled to the feed lot as needed. Many shocks twist down and partially or wholly rot, all are soaked with the rains and beaten by the winds, get hard and woody, and are thus more or less damaged. It is a matter of common knowledge among feeders that after the first of March the fodder in shock corn is of little value. Under favorable conditions fattening cattle will eat only the best portions of the fodder, and the great bulk of it is wasted and thrown out to keep them up out of the mud. With all these things taken into consideration the gain in feed value to the average cattle feeder who uses shock corn by siloing the corn is, in our judgment, not less than 50 per cent. We carry upon the same land more than 50 per cent more cattle than we did before we had the silos, and whatever the correct theory of the matter may be, this solid, hard fact is sufficient to satisfy us that very much more can be got out of the corn plant fed in the form of silage than when fed dry in any manner which is practicable with us.

Second—Gains can be made cheaper with the corn plant in the form of silage than when fed dry as shock corn.

The average price of corn in the crib on the farms of Ohio during a series of say ten years is probably not far from 40 cents per bushel. This makes an acre of corn making fifty bushels worth $20.00. If the same corn yields eight tons per acre of silage the value of the silage is $2.50 per ton, and if no more expense has been put on the acre of corn when put in the silo than when cut, husked, and cribbed, or fed out in the usual way, the results from feeding each will be a true index of the relative cost of gains. Our experience has been that the cost of siloing the corn is not as much as cutting, husking, and feeding, or marketing the corn in the usual way. The cash outlay with us in filling the silos runs about 40 to 50 cents per ton. The cost of filling, however, is a matter which will vary according to conditions and circumstances. Were we putting up a less amount of silage, so that we would not have to hire teams off the farm, the cost would be considerably less, and a small force of men generally can be operated more economically than a larger one. With cotton seed meal at $25.00 per ton (it usually costs us $24.00 to $24.50), and clover hay at $5.00 per ton, the cost of a day's feed for a 1,000-pound fattening steer (or any larger weight, for this is the maximum amount any steer will eat) would be: Fifty pounds silage, at $2.50 per ton, 4 cents; five pounds cotton seed meal, at $25 per ton, 6 cents; four pounds clover hay, at $5.00 per ton 1 cent; total 11 cents.

This ration we have found will make a gain fully equal to or greater than a half bushel per day of shock corn, or a less amount of corn and all the clover hay the steer will eat, and at a very less cost. It is true more gain on hogs following cattle fed shock corn will be made, but not nearly enough to make up the difference in the value of the two rations. It must b eremembered too, that considerable benefits to hogs following cattle fed silage and cotton seed meal will accrue. Hogs grow and do well with no feed but the droppings, although a less number can be carried than with corn-fed cattle. Our gains on cattle thus fed on silage during feeding periods ranging from four to seven months have been from 1.75 to 2.5 pounds per day, and we find that they finish much more evenly, the hair and general appearance are much better than corn-fed cattle, and especially than cattle which are fed only shock corn. Fewer cattle get off fed or scour. In fact, such a thing has almost been unknown to us among the silage-fed cattle.

Third—Silage is especially well adopted to carrying stock cattle through the winter.

All that is necessary for stock cattle, where good sheds are provided, is silage and clover, alfalfa or oat hay, and you may expect gains of 60 pounds per month on cattle of fair quality. A striking example occurred in our neighborhood during the winter of 1903-4. A and B bought together a car load of Texas calves about November 1, 1903 and divided them by picking turn about. A put his on a ration of corn silage and clover hay giving all they would eat of each. B fed his all the fodder and clover hay which they would eat and in addition fed shelled corn, the amount not being accurately measured, but supposed to be 3 to 4 pounds per head per day. Each bunch of calves had open sheds and good bedding. May 1st, following A's calves had gained 300 pounds and then weighed 650 pounds, while B's had gained only 150 pounds and weighed 500 pounds. We are now feeding 1,000 Texas bred Hereford calves on all the corn and soy bean silage, clover, alfalfa, and oat hay which they will eat, and 2 pounds per head per day of cotton seed meal, and they are in fine condition and gaining rapidly. We have never seen so thrifty a lot of youngsters.

Fourth—The silo enables one to store a large amount of feed in a small space at the point where needed. We put last fall about 225 acres of heavy crops of corn and soy beans in one silo. One man can do the work of feeding four times as many cattle out of a silo as he could if he had to haul the shock corn from the field.

Fifth—The manure from the cattle is more easily handled and can be hauled out during the winter as made, at which time it has much more value than when left in the lot to ferment, bleach out, and wash away until the following summer.

Sixth—When the corn is put in the silo the fields are cleared so that fall seeding of small grains can be much more adventageously done.

Seven—Silage can be kept over for summer feeding to help out short or dry pastures. After August 1st, and often after July 1st, cattle will eat large amounts of silage even though running on what appears to be pretty good grass. Silage and cotton seed meal fed on the grass make gains rapidly.

But it must not be supposed that there are no disadvantages attending the feeding of silage to beef cattle.

First—It is expensive to build silos to hold any considerable portion of the corn crop on the farm of the ordinary cattle feeder, although I can see no way in which storage room for an equal amount of feed can be provided so cheaply; but the average cattle feeder does not want storage room—the fields are his storehouses. In my judgment, the cheapest as well as the best silo is one made of concrete. A silo holding 500 tons, or upwards, if material is reasonably available, can be built at a cost not exceeding 50 cents per ton capacity, and it will be practically indestructible.

Second—Silage, being a succulent, cooling food, it is necessary to have good barns and sheds in order to successfully use it for beef-making purposes. These are expensive. Cattle full fed on shock corn, if they have a good bed and are out of the mud, appear to do about as well with a barbed wire fence for a windbreak as in a warm shed or barn. In fact, our trouble when we were using that kind of feed was to get the cattle to go in the barns and sheds at all. They appeared to prefer the open air excepting the very severest weather. The corn nine out of ten was furnishing them more heat than they desired and they wanted to waste some of it in the open air. It will not do at all to leave silage-fed cattle, and especially young cattle, exposed to the weather. The feed will be largely thrown away if this is done. We also found during our three first winters' experience in feeding silage that it is impossible to keep the cattle in proper condition as to bedding with earth floors in the barns and sheds. It is absolutely necessary, when considerable numbers are being fed together, to have solid floors of some kind, and we have consequently concreted all our cattle sheds and barns, and this effectively remedies the trouble. There is no waste in feeding silage, nothing to throw out for bedding and to keep the cattle out of the mud, as with feeding shock corn. These concrete floors therefore require bedding, and for this we use wheat straw in liberal quantities and clean the sheds out two or three times each week. It is expensive to provide the concrete floors, but they should last almost indefinitely, and the amount of manure annually saved by them is a considerable item; but, again, this is an item upon which the average cattle feeder does not place much value, and it would have little effect in influencing his judgment or action.

Third—The greatest difficulty of all which we have experienced is the question of the labor at silo filling time. When we are ready to commence filling the silos nearly everybody else is commencing to cut corn, and it is frequently hard to get enough hands. The regular force of hands on the farm must all be drafted into service and every other kind of work stopped. We run two large cutters, and it takes a force of about twenty-five men and teams to keep them going. This kind of a force on the farm can be managed all right for a day or two in wheat thrashing time, but when you have three or four weeks' steady pull at silo filling it takes a deal of patience and perserverence to keep such a force of men moving. The novelty of the thing wears off and there is nothing in it but heavy work. However, we have each year managed to get through the job all right, and there is a sense of relief and satisfaction in knowing that the work of handling the corn crop is through instead of being dragged out through all the fall, winter, and spring months, as would be the case if the corn were to be cut, husked, and fed out in the usual way.

I have given the principal advantages and disadvantages which our experience in feeding silage to beef cattle has developed. I think they each, and possibly some others, will arise in almost any cattle feeder's experience in the corn belt proper. From a consideration of them it is clear that not every man who handles beef cattle should build a silo.

Some already have more feed apparently than they care to handle—they need more cattle rather than more feed. Others may not desire or may be unable to incur the expense necessary to prepare to properly feed silage. Still others may not wish to assume the additional care and worry incident to a 50 per cent increase in their holdings of live stock; but to the active, energetic, intelligent, capable owner of fertile corn and clover or corn and alfalfa farms anywhere in the corn belt, who is managing and controlling his lands himself and desires to devote them to stock raising and stock feeding purposes and is ambitious to attain the greatest success in these lines irrespective of the amount of work and attention to business involved, and who at the same time has a pride in building his lands up to and maintaining them in the highest possible state of fertility, the silo, in my judgment, presents opportunities and possibilities not afforded by any other methods known to the business.

CORN SILAGE AS A DUAL-PURPOSE FEED.

Brenton Steel, Madison County Indiana in Breeders' Gazette.

I have noticed repeatedly that writers in giving reports of feeding tests and in reviewing the relative merits of different kinds of feeds, corn silage is always classed as roughage, never being given the distinction of containing a large per cent of concentrates. I have never attempted a chemical analysis of the different kinds of feeds, and do not claim to possess a technical knowledge of the subject about which I am asking information.

Our corn silage hereabouts is made from corn that is in the dent, and that is often too dry for nice fodder, is very heavy, for the corn from which it is made will often make 60 bushels per acre, and cattle, hogs and horses as well as sheep are fed very liberally of it, the only trouble being to get them to eat anything else after having once had a taste of the silage. Consequently, the query would naturally present itself, Why should corn silage be classed simply as a roughage?

A friend of mine recently sold a carload of steers that brought the top of the market, and were the subject of unusual comment on account of being so nearly full fatted or what is termed full fed. These steers had nothing in the world but corn silage and pure, clean water. I wrote a communication to an Indiana paper last spring and described a similar circumstances where steers had been full fed by the same man but it was taken as a "fish story" presumably, for no one ever asked for proof of the assertions.

I weighed a stalk of corn last fall with one large ear of corn on it, just as it was brought from the field to be cut into silage, and stalk and all weighed 9 ½ pounds, and the ear alone weighed 4 pounds and was hard and thoroughly dented. Farmers had quit cutting fodder because the corn was too dry, but the man putting up this silage was delayed in getting his cutter and could not cut any sooner, though he now claims it was an act of Providence, for all the papers, experiment stations and so-called experts had always claimed that the corn must be cut while in the milk or dough and while the corn was very green.

Why not have a sort of an overhauling of this silage question, especially as to corn silage? I am thoroughly convienced that there is entirely too much theory and not enough of practical observation and actual experience connected with what our writers and so-called agriculturists are telling us about feeds and their value, especially corn silage, and it is time that this wonderful feed was classed where it rightfully belongs. If made of very green corn no one will object to its being called a raughage, if left to mature until the proper time to cut it, then its exceeding value as a largely concentrated feed should be emphasized or else a new term invented by which we could distinguish it. I hope some of the knowing ones will take the pains to clear up this matter.

G---Regarding Pasturage, Alfalfa and Other Forage Crops.

VALUE OF PASTURAGE AND GRAZING.

By J. R. Sage, Director Iowa Weather Bureau.

In the Iowa crop report for 1904 the value placed upon pasturage and grazing was ninety milion dollars for the state, or an average of nearly $400 per farm of 160 acres. This item includes the forage consumed by farm animals in pastures through the season, and in meadows, grain fields and corn fields after harvest. This was put forth as a conservative estimate, but it appears that there are some who think the valuation is too high. In a note to the editor of The Homestead, Mr. C. Chambers, of Bussy, Iowa, takes exception and files a motion for a more specific statement as the lawyers say. Very well; Mr. C.'s demand to be shown the basis of that estimate is valid, even without his added statement that he once lived in Missouri. There is nothing sacred about a crop estimate, that it should be placed beyond revision and correction if necessary. After a thorough study of the matter, and consulation with scores of practical farmers, I have reached the conclusion that heretofore we have not given due credit to that part of the soil's product which is harvested by live stock, and is not measurable in bushels or tons. So an honest effort has been made to read just the account between the cereals and forage crops, giving to each its equitable share in estimates of the year's output.

Now, inasmuch as we cannot reckon the value of pasturage and grazing by the bushels or ton, we must make an estimate on the basis of the value of farm animals and dairy products. This involves consideration of two questions, viz.: Ist, what percentage of the growth of live stock and the output of the dairy is derived from the pastures and grazing lands? 2d, what is the total value of the yearly output of farm animals and the dairy? In answer to the first inquiry the general opinion has confirmed my conclusion that from two-thirds to three-fourths of the growth and support of farm animals is derived from pasturage and grazing lands. Many farmers will say the percentage is still higher, but take the lower estimate—two-thirds. As to the second question, we must appeal to the U. S. Census report for 1900. According to that authority the total value of animals sold, and animals slaughtered on farms in Iowa in 1899, was $121,527,461. And the value of dairy products was $27,516, 870. Total value of animals and dairy products, $149, 044, 331. Two-thirds of that sum: $99,362,887.

The census year was about an everage in productiveness. Therefore on the basis of the official figures we find that pasturage and grazing should be credited with the sum of $99,362,887. But to be extremely conservative the amount has been placed at $90,000,000—a little less than $400 per farm. From this point of view, are these figures too high? Where is the error in the reckoning?

By another method of figuring we may arrive at about the same result. The hay crop of the state, cut from about four million acres, is worth over $30,000,000. Using that as a basis of reckoning what should be the value of eight million acres in pastures, harvested by stock seven months in the year, plus the grazing in meadows and grain fields after harvest, and the range of eight million acres in corn stalks through the late fall and winter? It is not an exaggeration to say that pasturage and grazing count three fold the value of the hay crop in the production of live stock and in the dairy.

And now, it may be added, if this valuation of the foremost product of the soil is too high, the selling price of farm land has reached an unwarranted figure. No man can afford to pay eight to twelve thousand dollars for a quarter section farm, if in its operation he cannot make the pastures and grazing lands pay at least $400 a year. The average must even exceed that figure to justify present prices of land. I believe the land is not overestimated in price, because of my conviction that the crop reports are not exaggerated.

In Iowa's agricultural resources there are two elements of greatness, viz,: an immense productiveness of grasses and forage crops, and the requisite qualities of soil for growth of great crops of corn. These are like the two wings of a bird; they must be operated together in order to make much progress. Grain farming alone is ruinous, but it is possible to attain a good measure as success by devoting the entire farm to grass and live stock. The best results are obtained by combining both grazing and corn growing.

BETTER YIELDING GRASS LANDS.

By Prof. Chas. F. Curtiss, Dean of Agriculture, I. S. C.

We have had and are having a great corn revival throughout Illinois and the entire corn belt and it is an excellent thing. It certainly means that we are going to produce very much better results. We are going to get more from the corn lands of this great West, but we need to have as well as a corn revival, a grass revival. We need to study the grass crop as well as the corn crop.

The two great products of the central west are corn and grass and the greater of these is grass. This is, the grass and the forage crops of our farms and our farming states are of greater value, taken the one year with another, on an average, than any other single crop that we produce.

As a rule, we give less consideration to the hay and grass lands—and especially is this true of our grazing lands—than to any other part of our farms. I believe they are the lands that are the most susceptible to improvement, and it is the crop in which we can increase the returns with the least expenditure of additional labor, and at the least cost.

We are confronted with new conditions in the agriculture of the central west today. We have seen these lands advance, within a decade or a little more, from $50 and $75 to $100 and $150 per acre, and in dairy stock and it is my prediction that they have not yet reached the limit. At the same ime, while hese western lands have been advancing in value we have experienced a decline of 25 to 50 per cent in the lands further east, the lands of the Ohio and Miami valleys and eastward from that. There will somethime be a corresponding advance in the lands of some other sections, if we do not give attention to the right methods of maintaining he producive capaciy of our farming land.

We all know that as valuable as corn is, it is not a complete ration, and if we expect to produce the best results in growing animals, and in dairy stock, and in developing horses, and in maintaining the breeding qualities of our animals, we must have a variety of feed stuffs. We must have the constituents that go to build up the bone and muscle and properly develop the animal in the highest form and highest state of excellence. These things are absolutely essential; never so much so as today, in view of the high-priced land that we have, in view of the quicker returns we must get from these animals, and the higher excellence that we must produce in the finished product. That point is generally conceded by the most successful stock men. In the face of the fact that we have higher priced labor, higher priced feed products of all kinds, the problem presented is, how we may cheapen the production of these animals by the ration we use, or the methods we employ in growing and producing them on our farms, and produce the finished product at comparatively a lower cost and without sacrificing any of the excellence.

I believe that the grass crop affords today the surest and most practical means of accomplishing cheaper production. That is, I think if we would give to the improvement of our forage crops and our pasture lands the same attention we have given to the improvement of our cultivated crops and our grain crops, that we would receive a larger increase, larger returns for less expenditure than any other improvement that we may have.

It is sometimes said that when land becomes worth a hundred dollars an acre or more, that it is worth too much to maintain in grass. I believe that statement and that theory are entirely fallacious.

You will find today in the rich agricultural land of Great Britain a larger area of grass, relatively, than you will find in Ilinois or Iowa. You will find lands worth three or four hundred dollars per acre more largely devoted to the growing of grass crops than they are in this country. And I believe, if we are to maintain our farms in the highest state of productive capacity, and conduct them with the highest profits, we shall be obliged to devote a large part of our farming lands to grass production, and relatively less to corn production.

I believe that if we were today to reduce the cultivated lands devoted to the grain crops twenty-five per cent and apply better methods, and devote that reduction of grain crops to grass production, that we might maintain our present output of grain, and at the same time have this increased grass land, that could be applied to the production of live stock, with greater profit than any other part of the farm. And I think it goes without saying we all recognize that we could reduce the acreage of our cultivated grain crops one-fourth per cent without decreasing the yield, if, at the same time we could apply the best methods of more thorough cultivation and of rotation, and the improved methods of agriculture which are being introduced today.

Now, in view of the fact that the grain crops save all advanced in value, in view of the fact that everything a farmer buys to balance his corn crop is high priced, and will undoubtedly continue high in price, I believe that we have, right on our farms and in the products of our farms, the means of balancing the ration, with greater economy and with greater profit, and with greater advantage to the maintenance of the fertility of the farm, than through the purchase of any of the by-products from the factories or the mills. These products must continue to be high, and while of course we do not expect to quit producing them, because there is a certain output from our factories and our mills that must always be consumed on the farm, and they ought to be consumed here rather than go abroad, yet there is a limit to the price we can pay for them and utilize them with profit.

Instead of paying out a large amount of money for these products at high prices, we might better produce on the farm the feeding stuffs containing the nutrients and the elements of growth and muscle and bone making that we need in our animals. The safest, the surest and the best means of producing that will be through the grass crops rather than in the grain crops.

Now I think we could, in the first place, extend the grazing season from two to three months in the year, on nearly every farm throughout this state and other states similarly situated. In fact, we do not get grazing more than five or six months in the year, seldom more than five months. Wherever we can grow blue grass, we can extend the grazing period to eight or nine months, without serious difficutly. Particularly is that true with regard to the production of horses and of beef cattle. It can not be so readily done with dairy cattle for the reason we can not expose them so much, and have them out so many months in the year.

But by maintaing our lands in good condition, and providing for a good growth of grass throughout the summer months, and carrying a surplus into the autumn and over the winter, we can graze up till the first January in nearly all parts of Illinois. From this latidude south there will be no difficulty. And then, by maintaining a surplus of grass on the pastures over winter, we can turn stock out by the first of April instead of the first of May. So we can add two months to the grazing period at the end of the season, and one month at the beginning of the season, by holding in reserve on our grass lands a surplus of feed, which can be drawn upon at any time.

In order to do this, however, it will be necessary to give attention to the grass lands, in the way of building them up; in the way of cultivating them. If we expect to grow a crop of grass we must expect to feed that crop the same we feed our live stock. And we must give the same attention to the cultivation and maintenance of the grass lands in the best state of fertility that we give to other parts of the farm. Three-fourths of our grass lands are relatively neglected lands. The pasture lands, as a rule, are the poorest and most inferior parts of the farm.

It is not always the case, but as a rule, the pasture receives no consideration, until all other parts of the farm have been brought under improved methods. And if we were to give it the annual attention in the way of top dressing, in the way of harrowing and distributing fertilizer, in the way of renewing the grass seed, and in the way of drainage, keeping the soil sweet and light and in the best possible condition, I believe that we could practically double the output from our pasture lands.

One of the first essentials is to see that we have a good stand of grass. So many of our grass lands are simply set aside to grass, and they are grazed closely from the beginning to the end of the season. The soil bakes, and becomes what we call hide-bound at times. The grass dies, and then if it is exposed when it is bare during the winter and during the midsummer's severe drouth, it dries out and kills out, and very soon we will have not more than half or three-quarters of a stand of grass on many of our grazing lands. And whenever that condition occurs, nature provides for a covering, and the weeds come in there, and they take possession of the soil just as soon as there is an opportunity. Just as soon as there is a reduced condition or weakened vitality of the grass crop, the weeds will come on and take possession. So that over a large part of our grazing lands, we have not a stand of grass at all, in many cases not to exceed a half stand.

The first thing should be to secure a stan,d after providing drainage. Of course that should be the beginning of all agricultural operations. We should have our grass drained, as well as our agricultural land, and if we do not we cannot expect returns. Of course we may get an inferior coarse, rough sort of grass, but it will not be the grass and it will not be the production that we must have from our valuable land today. No man can afford to own valuable land today that is not drained.

That should be the beginning. Then we ought to go through our grass land and make sure of getting a stand, the very first thing we do. I do not mean that we ought to put a plow in and plow them up regardless of conditions or what we want to use them for. I want to say emphatically that the best grass land of the world, in all farming countries, is land that has been devoted to grass for centuries. And that will be so in this state. Of course it may be desirable, and will be desirable to rotate a good part of the farm, but if certain portions of the farm can be put into grass and left there permanently, it will be much better than to be continually plowing the pasture land. If our land is lacking a stand in grass, it will not be necessary to put a plow in and plow it up and reseed, to start over again. We can put the disc and harrow in there and give the surface of our pasture land a thorough cutting up; so complete a cutting up that it will look perhaps, as though but little grass remained. But put on, in connection with that, clover and timothy seed, and alsike and we can at once get a stand of grass without in any way disturbing the sod which has been there so long, and which is of such great value in getting the land up to its highest state of production. It will surprise you to see how much this will improve the grass land.

We have recently made some experiments on the college farm at Ames with blue grass pasture land that was not by any means in a low condition. It had been pastured, but kept up in a good state of fertility, but by going on it in the spring, just as soon as the frost was out of the ground, and putting a disc on and cutting it up, and then sowing the grass seed at the rate of two or three pounds per acre, dependent upon the varieties—sometimes as much as five pounds per acre—and following that with the harrow, and then not pasturing too heavily for a time, we have been able to add as much as one hundred per cent to the productive capacity of the soil in the first season, and that advantage will accrue for several seasons to follow.

It is very easy to add fifty per cent to the grass crop in a single year, by this method. Instead of having grass growing weeds we can have the entire area growing grass. There is never any trouble about weeds in the pastures, if you first have the soil in good condition, and have grass enough to make a good stand. We see weedy pastures all over this country, on the best farms as well as on the poorest, and in nine cases out of ten the sole trouble is that the methods of managing this grass land have been wrong, and the weeds stand is a protest against the farmer's methods. The weeds would not be there if the methods had been right, and if there had been an opportunity for the grass to take possession of the soil. If you give our grasses possession of the rich farming land of central Illinois or say any part of the state, and maintain the soil in the right condition, there will be no trouble in keeping down the weeds.

These are some of the first things that need to be observed in the growing of grass. Then, when we get our lands in that condition, we need to keep them there. It is like what the old English gardner said to an American lady, about making a lawn. In traveling in England she was very much taken with the richness and the velvety, luxuriant growth of the English lawns, and she thought she would get a recipe for making that kind of a lawn and have some in her own dooryard, so she asked him if he would kindly tell her how he made a lawn, and got it in such nice condition. He said:

"Madam it is very simple. I prepares the seed bed perfectly, and I sows the grass seed, and then I waters it and mows it and waters it it and mow for four hundred years, and then you have a good lawn."

Now, that is the way to make a good pasture. We must get the soil right, get the grass seed in there, and keep it in there, and then feed the grass crop the same as the corn crop. We know we can not grow corn unless we get the soil up and keep it up in a high state of fertility. And the same is true of the grass crop. It we give the same attention to the improvement of our grass lands, we will double the returns for the outlay and labor and expense that we would get in improving our tillable lands.

THE PERMANENT PASTURE.

WALLACE'S FARMER.

Under western conditions and with land worth a hundred dollars an acre we don't think it advisable to devote very much of the land on the farm to a permanent pasture. It is, however, always advisable to have some portion of it on which the plow is never under any circumstances permitted to enter. In this article we aim to get three ideas clearly in the minds of the reader: First, how to lay down a permanent pasture; second, how to keep it in the best condition; third, how to get the most good out of it.

It is better to put the permanent pasture on land that is not desirable for rotation; for example, hilly land or land broken up by sloughs, or land that has gravelly points in it, or land that is at too great a distance from buildings for economical cultivation. On this land should be sown every variety of grass that is known to thrive in that section, for reasons pointed out in another article and treated more fully in this. A permanent pasture should furnish the earliest possible bite and the latest possible bite. From the time the warm spring days come cattle long for a more succulent feed than that to which they have been accustomed during the winter season. The very sight of green grass and the smell of it takes away the appetite for hay and fodder and everything else except silage, which furnishes the succulence.

The farmer can't afford to turn these cattle into his meadows. He therefore needs a permanent pasture. There is a perceptible decrease in the gain of cattle when they are changed from grain to grass. It ordinarily takes nearly a month to get them adapted to the new diet. This time, however, can be very much shortened if the farmer has a permanent pasture which has not been too closely grazed during the winter, but which has more or less dead grass through which the green grass is coming up. Cattle eat both together. The dead grass prevents scouring, and they are ready to shed and get down to their summer work a month earlier than they would on dry feed. They thus gradually become accustomed to the new conditions, which frequently means a hundred pounds additional gain on a steer during the summer season.

The reason why the greatest variety of grasses should be sown in the permanent pasture is because no one grass is good during the entire season. What is needed is as nearly as possible a constant succession of bloom. In the timber sections south of central Iowa orchard grass should be an ingredient in the permanent pasture; and in fact in all sections where it is known to do well. This grass furnishes the earliest bite. It also makes a more rapid growth than any other grass during the dry season of July and August. It is at its best at the time when red clover is at its best, and from ten days to two weeks before timothy is at its best. Therefore orchard grass should be sown in small lots in every permanent pasture in localities where it is known to do well. It has its faults. It persists in growing in tussocks, one plant graudally producing fifty or a hundred stems. It therefore can't form a sod and hence should never be sown alone, and never with clover alone except where it is intended for meadow.

No permanent pasture should be without a liberal sowing of blue grass. Blue grass is the one plant which winter never injures and which withstands the driest summer where treated half way right. It is impossible to kill it by neglect and only the most atrocious treatment can permanently injure it. Blue grass, however, has its faults. It starts early in the spring, four or five days after orchard grass. In the latitude of central Iowa it matures its seed in the last half of June, is at its best three weeks before red clover. Then it stops growing except in the wettest seasons. In fact, seldom does anything till the fall rains set in; but it makes phenomenal growth in blades and keeps on growing until after every other plant has closed up its business for the season, remains green under the snow and makes an early growth in the spring. It is not a soil enricher like the clover, for the reason that it is dependent on the soil for its supply of nitrogen. It enriches the soil to the extent of its root development; or to be more accurate, to the extent to which it supplies humus, but to no greater extent.

Some grass must therefore be supplied for permanent pasture that will occupy the time of the land during the months of July and August, and that will also furnish nitrogen for the blue grass and timothy. For this reason every permanent pasture when laid down should be well supplied with all the clovers that will thrive there. We would sow both the common red and mammoth and put in a small sprinkling of both alsike and white, although it is scarcely necessary in the older parts of the country to sow white. It will come in of itself. A pound to the acre, however, would not be amiss, and also a pound of alsike. In other words, if we were putting down a permanent pasture we would sow four pounds of blue grass, two pounds of orchard grass, four pounds of mammoth, one pound of white clover, one pound of alsike on dry land and two pounds on wet.

This may seem to many of our readers heavy seeding. You want a pasture. You can't afford to stint the grass seed either in amount or in variety. Assuming now that you secure a good stand what do you have the next year? First, the early bite in the orchard grass, next in the blue grass, followed by timothy. In the latitude of Des Moines the blue grass will begin to head out from the 25th of April to the 4th of May, according to our observation. Red clover comes next in bloom, and two weeks afterwards mammoth. This carrier you well on to July, and if your common red clover is partially pastured off, the bloom will be deferred well on to the middle of July. Your orchard grass then gets its second wind. and we have seen it grow half an inch a day in the very driest time in August; in fact, it pays little attention to dry weather. In this dry season your white clover does but little, as is also the case with the alsike if it has not been closely pastured. If it has, it will still try to produce a seed crop. During the fall you have timothy and red and mammoth clover; but blue grass literally spreads itself and gives you just what you want in October and the early part of November.

It is important, however, in handling permanent pasture not to pasture too closely and particularly after the blue grass has monopolized the land. Blue grass is a born monopolist, as bad as the Standard Oil or the beef trust. It has to be controlled, which can be done only by sowing every second or third year red and mammoth clover. It is kindness to the blue grass to do this, just as it would be kindness to trusts to control them. Permanent pasture after blue grass has aken possession is always better for being thoroughly scarified, chastised, prevented from being a monopolist.

Managed in this way the permanent pasture can be made one of the most profitable parts of the farm, worth a hundred dollars an acre. Managed as it ordinarily is, it is not highly profitable. If a man is not willing to adopt these methods and get the right sort of permanent pasture, he might just as well put it under rotation. It don't pay to have permanent pasture lazying around and putting in half its time. When land gets to be worth a hundred dollars an acre it must work all summer, and if it is not working must be made to work.

USES AND ABUSES OF PASTURES.

J. N. Dunn, before Linn County Farmers' Institute.

What is a pasture and what is it for?

My ideal pasture would be a field enclosed with a good woven wire fence 48 inches high, with a sharp barbed wire on top. The openings should be closed with gates made of boards. The ground should be rolling and uneven, the higher ground to furnish the best feed in wet times and the lower, which should be a little too cold and wet for corn, in the dry times. The soil should have a tendency to clay and never have had a plow touch it. The ground should be covered with a dense growth of blue grass at all seasons of the year. On the north side should be a thick growth of timber for the protection of stock in winter.

I think the nearer the a pasture comes to this the more satsifactory and profitable it will be. Such a pasture will fiurnish all the necessary feed to colts over one year old, and horses not at hard work ten to twelve months of the year; stock cattle over one year old, dry cows and sheep 8 to 10 months of the year; milk cows 6 to 8 months; and hogs quite an amount of the best of feed.

To indicate somewhat of the uses and abuses of pastures let us take an illustration. A and B are neighbors. Their pastures join, are about of the same size, and they have about the same amount of stock. The spring is very favorable for the growth of grass. B walks out in his pasture and sees the overabundance of grass anl says to himself, I can just as well keep as much more stock here. He goes out and buys a few head paying a good deal more than they are worth, because nearly everyone has plenty of pasture and wants to keep what he has.

Haying time comes. B sees places in the pasture where it is about as good moving as in his meadow. He concludes he will not let that grass go to waste that way, so he hires more help and puts it into the barn or stack, thinking all the time what slip-go-easy if not shiftless farmer A is, for he has not bought another animal nor done anything to save the grass that is going to waste in his pasture. But A is having different thoughts. He is thinking there may come a long dry spell and likely the stock will eat about all the grass before grass grows again next spring, or if it does lie there it will protect the roots, and even if some of it does rot it will be a fine fertilizer right where he wants it. He will save the expense of making it into hay and will not have to pay a man about $1.25 per day, including board, to do half a day's work running a $100 manure spreader to get the manure back on the ground; nor will it go with the wash of the barnyard down into the slough on to the creek and be lost.

The last of July comes. No rain. The stock keep eating but the grass does not grow. The dry spell continues. The feed is getting short in B's pasture, the flies are bad. With empty stomachs gnawing on the inside and the flies on the outside his stock is restless and uneasy wandering about, trying to find something with which to satisfy their hunger.

Milk cows dry up and all his stock grows thin. They find weak places in the fence and get out. After they get out two or three times B has to work and sleep with one eye on his stock, and material to repair the fence at hand. and all this time he is blaming the man who he thinks sold him unruly stock.

Take a look at A's stock. In the early morning they fill themselves with the abundance of grass, dry but moistened more or less by the dew. As the heat of the day comes and the flies bother they seek a shady, cool place. or bunch together, as some tell us, to create a current of air that will make it cool and blow the flies away. As evening comes and the flies lay down their labors for the day the stock scatter out, fill themselves again lie down and quietly rest till morning, thus holding their own or gaining in weight.

A nice shower comes. The grass roots in A's pasture take on new life and send up green shoots, but in B's pasture the roots are so nearly dead that most of the moisture is used to resuscitate them, and very few shoots are sent up. There are more showers, and the growth in A's pasture is abundant but in B's the growth is low, and the hungry stock eat the grass as fast as it comes up. Cold weather comes.,B has to feed his stock from this time till along in May, and being in poor condition they require considerable grain to get them through the winter in any decent shape. As stock continues to run in the pasture laying on fat, and with the exception of some salt and occasionally on a cold stormy night being taken to the barn and fed some hay, they require no attention till snow comes. If the snow is not very deep his horses will get nearly all their living by pawing the snow away and eating the grass, doing better than they did in fly time; and if the weather is not severe his cattle will leave good hay and go out to nose in the snow for the grass.

His stock, except the work horses, milk cows, and stock fitting for market, being in good flesh, require no grain through the winter. When the snow goes off much of the blue grass is as green and fresh as can be and with the dry grass makes the best kind of feed. Nearly all kinds of stock will leave the best hay for this feed. With the first warm weather the grass starts up in A's pasture and good feed will be about a month ahead of that in B's pasutre.

At the middle of May B's stock is in no better condition than A's, and they have eaten twice as much hay, corn fodder, ensilage, frain or other expensive feeds.

These may be extreme cases, but I think similar ones can easily be found. Which of the two do you think is financially ahead? Which has the most enjoyment in tending his stock? Linn county land is high but extra help is not very plentiful or cheap and is not always of the first quality. I do not wish to be understood to recommend a slipshod manner of farming. Grass is a thing that canbe neglected. The way to grow it profitably is to let it alone—just let it grow.

Another use for a pasture is for a health resort, and if it were used more for this there would be fewer diseased animals. I would not say a word against a veterinarian. A good one is a blessing to any community.

As most of you know there have been a good many cattle, hogs and horses raised at Maine Valley farm. I can speak from actual knowlelge for only the last 18 years, but during that time a veterinarian has been called only two or three times and a regular M. D. only four times, and we have lost comparatively but very few animals. We may be kind of "grannies" and we keep on hand a few samples remedies to use when necessary, but I think that the general good deal health of the animals has been to a great extent due without much exercise and burn them up with grain. If you want healthy animols turn them out on a good pasture.

Except when at the very hardest work turn your work horses out in the pasture nights and Sundays.

If an animal gets a barbed wire cut do not take it up to the barn, but wash it out and put on medicine two or three times a day. The poison from the stable will do more hurt than your doctoring will do good. Just put into the fresh cut a little boracic acid, air slacked lime, turpentine or even kerosene and turn the animal out in the pasture, simply watching to see that the flies do not blow it, or proud flesh get into it. Most cases heal up smooth and nice.

A pasture may be abused indirectly by failing to keep a good fence around it because injury done stock by a poor fence will be charged against pasturing. The ideal fence spoken of is too expensive for general use at present, but we all can have good barbed wire fences. We often hear what a terrible thing a barbed wire fence is, but usually it is not a barbed wire fence but simply an excuse for one that does the damage part of the posts rotted off and leaning over, wire slack so the stock reach over or through it, ends of broken wire lying where the legs of animals get tangled up in them.

Perhaps one of the worst things is to build a barbed wire fence across where stock is used to running and not show them it is there. When such a fence is built the stock should be led or driven to it, and against it a little if possible, letting them know it is there, and the probability is they will not run pell-mel against it and be bady cut.

Another way to abuse a pasture is to allow a growth of brush or tenacious weeds. If a certain kind of weed grows in the same place year after year they better be looked after or they will take that piece of ground and spread out for "new" fields to conquer." But I am not so afraid of weeds in a pasture as some are. They protect the grass from the burning sun in a dry time and stock will eat a good many kinds for spice or variety. A good healthy patch of weeds is preferable to a spot of bare ground—they show that soil is under them, and they will decay and make it all the richer. Who ever saw ground become worn out by growing weeds?

Stock may tramp a piece of ground till they destroy all signs of vegetable life, but nature will develop the seeds she has stored up and the weeds springing up will loosen up the hard, compact ground. Men may adopt a systematic plan of soil robbing but nature will seek to restore the feritility of the soil by growing weeds.

The large majority of weeds that grow on good sod are like tramps—come and are gone. One year you may think a certain weed has taken a pasture, but the next year you can hardly find a weed of that kind. Do not take this as a recommendation to let cockle burrs, button weeds, etc., grow on cultivated land or to let the roads go unmowed weeds on cultivated ground and on sod are two things, and the road does not need enriching.

So far we have considered more especially blue grass pastures, but think most we have said will apply to any pasture. We do not expect our ideal pasture to fully materialize, and of course conditions and environments alter cases.

There are some farms where nearly all the land is good farming land and the occupants have plenty of help within the family and so want to farm all they can. But even in these cases there ought to be a good pasture. A farm can hardly be kept up without stock, and stock cannot be kept to advantage without pasture. Clover of various kinds and timothy make a good pasture after the first year, but will not make as good pasture at all seasons of the year as the blue grass. In the rotation of crops pasturing will be very beneficial to the land. On most farms there is land too rough or too wet and cold to make good farm land, but it will make the best of pasture. There may be places where it is so wet that only slough grass will grow, and one-half the tile it would take to dry out these places for farming will put the ground in excellent shape for pasture, and blue grass will work in very rapidly. We would advise having at least some blue grass pasture and then finish out with pasture of other grasses if necessary. We think the second crop of meadow, as a rule, should not be mowed but pastured. Coming at a time when usually the pastures are dry, and flies very annoying it gives the stock fresh feed and the pastures a rest.

We think on most farms a good permanent blue grass pasture will net as much per acre and perhaps more than any other field. Do not think you can get first-class pasture in two, five or even ten years. It may take fifteen or twenty if the land has been farmed much. So be slow about plowing up a good pasture. Hold to it as a treasure. Do not think of the great corn crop that field would yield but think of the amount of feed the stock get off from it, with very little labor or expense to you.

ALFALFA GROWING.

(Extracts from U. S. Department of Agriculture Bulletin No. 215.)

BY

A. S. HITCHCOCK.

In Charge of Alfalfa and Clover Investigations, Grass and Forage Plant Investigations, Bureau of Plant Industry.

DESCRIPTION OF THE PLANT.

Alfalfa is an upright, perennial plant, somewhat resembling red clover, but the purple flowers are in a long cluster rather than in a compact head. These clusters are scattered all over the plant instead of being borne on the upper branches, as in clover.

The plant has a long taproot, which descends to a great depth where the soil permits. At the surface of the soil is soon formed a strong crown from which spring, the new stems, as shown in figure 3.

Young plants of sweet clover (Melilotus alba) closely resemble alfalfa, for which they are often mistaken. In the later stages the sweet clover is easily distinguished by its tall growth, biennial habit, and white flowers. A seedling plant of alfalfa is shown in figure 4.

TURKESTAN ALFALFA.

A few years ago the Department of Agriculture imported from northern Turkestan a variety of alfalfa, which was distributed for trial to several experiment stations and a number of individual growers in various parts of the United States. This alfalfa, now generally known as Turkestan alfalfa, was found growing in semi-arid regions, and showed great resistance to drought. The results of the experiments in this country show that it is somewhat more resistant to drought than the kinds already grown, and is probably better adapted than the ordinary kind to dry regions where alfalfa must be grown without irrigation. The Department is unable to supply more seed of this variety, as the original importation is exhausted. Several seedmen advertise Turkestan alfalfa, but the seed that is advertised has not been given comparative tests to determine its value. Such value depends largely upon the part of Turkestan from which the seed is obtained; for Turkestan is a large country and not all the alfalfa grown there is of a particularly drought-resistant sort.

ALFALFA IN THE EASTERN STATES.

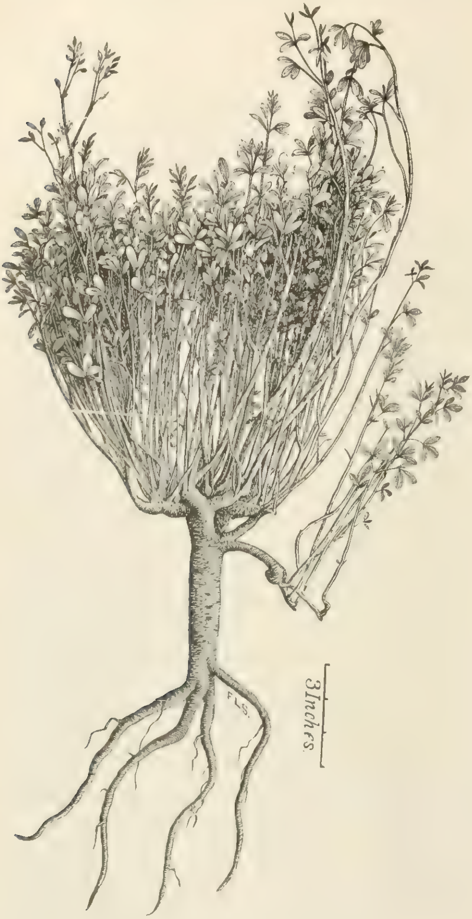


Fig. 3–Alfalfa, 3 years old.

Although alfalfa has been grown for a long time on a small scale in many localities in the Eastern States, it is only within a few years that serious attempts have been made to extend its culture and place it among the important forage crops of this region. Alfalfa is now being grown successfully on a field scale in the alluvial back bottom lands of the Red River in Louisiana, the Mississippi River from southern Missouri to New Orleans, the Yazoo delta in Mississippi, the black prairie belt of Mississippi and Alabama the bluegrass region extending from Tennessee to New York and Iowa, and various isolated but favorable localities elsewhere. The attempts to grow alfalfa in New England have been successful in but comparatively few cases. The fact, however, that in some cases these attempts have been followed by success shows that the alfalfa area in this region for its growth are better known. Every year sees an extension northward of the alfalfa area in Minnesota, Wisconsin, and New York. A particularly hardy strain has been grown in Carver County, Minn., for a number of years. The Minnesota Experiment Station has found that the seed from this strain gives satisfactory results, and confirms the statement that alfalfa can be acclimatized in regions much farther north than where it is now commonly grown. Alfalfa is a standard forage crop in the limestone districts of southern Ontario, and is grown here and there as far north as Ottawa and southern Quebec. In Nova Scotia it can be grown, but the soil conditions are unfavorable, and it does not complete with red clover.

CONDITIONS REQUIRED BY ALFALFA.

CLIMATE.

In mountain regions alfalfa growing is limited at high altitudes by the low winter temperature and also by the low mean summer temperature, the limit varying from 3,000 feet in the north to about 8,000 feet in the south. Along the northern border alfalfa culture is limited by the low winter temperature.

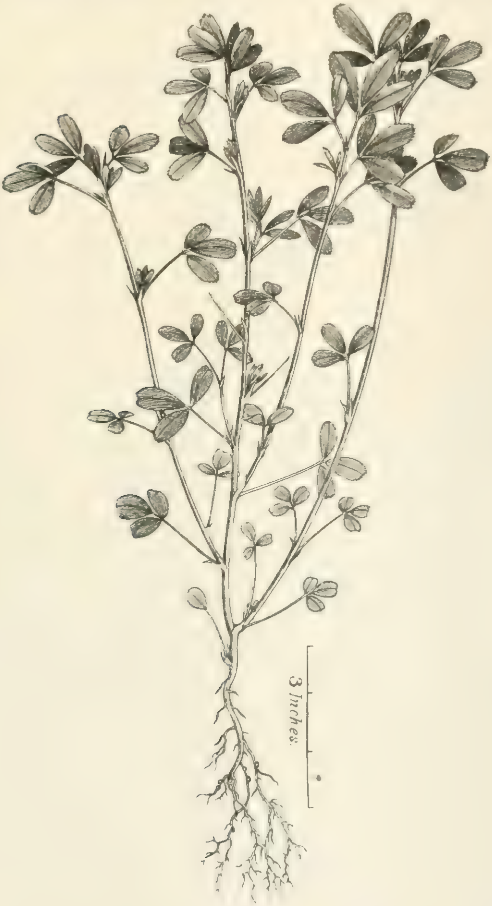


Fig. 4.

Northern grown seed is more hardy than southern-grown seed, and by gradual acclimatization the limit of the alfalfa belt will be gradually pushed northward. These results may be aided by the introduction from the Old World of strains already accustomed to a cold climate, as has been illustrated by the importation some years ago by this Department of a variety from northern Turkestan known as Turkestan alfalfa, which showed itself better adopted to dry regions than the strains already grown in this country. But other conditions modify the effect of the winter season. Alternate freezing and thawing tend to loosen the growing plants and heave them out. This action is not so likely to take place in an old field where the plants are well rooted. Where the soil is cold and wet in the spring, as is usually the case in New England, the growth of alfalfa is greatly hindered, and this given as one of the chief causes of failure by experimenters in that region. Good drainage and improvement of the texture of the soil will aid in preventing such failure.

Although a well-set alfalfa field will withstand considerable drought yet the growing of alfalfa is limited by insufficient rainfall unless water can be supplied by irrigation. In general, alfalfa requires about 20 inches annual rainfall. In the southern portion of the United States more than this is necessary, and in the north, on account of the cooler climate, a less amount may be sufficient. Much also depends upon the distribution of the rainfall, the water-holding capacity of the soil, the depth to permanent moisture, the presence of seepage water from neighboring slopes, and other local or climate conditions which affect the evaporation of the available water supply through the growing season, so that it is impossible to state the necessary rainfall in other than an approximate manner.

SOIL.

Favorable Conditions.—Alfalfa grows best in a well-drained, loamy soil with a subsoil sufficiently open to allow the roots to penetrate to a considerable depth; yet an examination of the soil in the various alfalfa districts shows that there is a much wider variation in the soil conditions than has generally been supposed.

Acidity of soils and other unfavorable conditions.—The Missouri Experiment Station has shown that an acid soil is unfavorable to this crop, a fact which has been corroborated by the experience of growers in the East. This unfavorable condition can be corrected by the application of lime, the amount depending upon the degree of acidity. It may be in any given case that the unfavorable factor is not the acidity of the soil, but compact texture, lack of aeration, or some other condition which is corrected by the incorporation of lime or the accompanying tillage.

Excess of water.—An excess of water in the soil is a very unfavorable condition for alfalfa. Where the water level is near the surface, or where the surface water from heavy rains is unable to drain off rapidly, alfalfa usually fails. For this reason an alfalfa field is injured by being submerged from an overflow, or even killed if the water remains over the surface for too long a period. Experience has shown that when covered by clear running water the injury is much less than when a sediment is deposited or the water is stagnant. Ordinarily alfalfa will not withstand an overflow of more than a few days. Flooding in the winter is less injurious than during the growing season.

Nature of subsoil.—It is generally stated that alfalfa requires a porous subsoil, but this statement must be modified. If the subsoil is near the surface and is of such a nature as to prevent the entrance of the alfalfa roots, alfalfa will probably fail; but many of the so-called imprevious subsoils allow the roots to penetrate. The effect of the subsoil seems to depend on how its effects drainage and upon the texture and fertility of the surface soil. The reports of successful alfalfa fields upon subsoils of gumbo, hardpan, and stiff clay are too numerous to disregard. Near Syracuse, N. Y., there is an alfalfa field growing upon a rocky hill where the coating of the soil is only 2 to 4 inches in depth. The success under such apparently adverse conditions is due to the fact that the roots are able to penetrate the numerous vertical cracks in the rock.

Need of fertility.—An important condition and one which is likely to be lacking in many of the worn-out eastern soils is fertility. It is very essential that the soil be in the condition usually described as fertile. This refers not only to the presence of the required mineral elements but to humus and to a favorable texture. It is not worth while attempting to grow alfalfa upon sterile soil. Such soil should be enriched by the addition of barnyard manure or other fertilizer or by the plowing under of leguminous crops. Compact, cold, or wet soil is unfavorable to the growth of alfalfa, and such soil should be drained and thoroughly aerated by cultivation to reduce it to the proper texture.

Sandy soil is not usually well adapted to alfalfa, partly because it may be sterile, lacking in humus, or too close in texture. If a stand is once obtained the crop may not suffer from lack of moisture, as there is usually a water supply below the surface? In the Southern States sandy soil is so favorable to the growth of crab grass and other weeds that alfalfa is soon chocked out. In general it is well to prepare sandy soil by incorporating humus and fertilizing and by suitable culture to free from weeds.

NITROGEN GATHERING NODULES.

It is well known that alfalfa, in common with other legumes, has up on its roots nodules or tubercles produced by certain bacteria with whose aid the plants are enables to obtain a supply of atmospheric nitrogen. By the decay of these nodules the soil becomes richer in nitrogen. Though alfalfa can grow without the presence of these bacteria, especially if the soil is rich and there is an abundant supply of nitrogen; yet under normal field conditions the growth is much more vigorous when these organisms are present, as indicated by the nodules uopn the roots. The seedling plants are infected or inoculated from the soil if the organisms are present. Where these are not already present it is necessary to inoculate the plants artificially in order to produce the best results. This can be done by scattering upon the field soil from an infected field or by placing the bacteria directly upon the seed before sowing. The latter procedure has been rendered practicable by the use of pure cultures, a method perfected in the Laboratory of Plant Physiology of the Bureau of Plant Industry of the Department of Agriculture.

Throughout the region west of the Mississippi River and a considerable portion of the Eastern States this organism seems to be already widely spread in the soil. At the Illinois Experiment Station it has been shown that the organism upon the roots of the sweet or Bokhara clover (*Melilotus alba*) products the same effect upon alfalfa as the alfalfa organism itself. Nevertheless the natural inoculation upon the first crop may not be sufficient for its needs. This appears to be shown by the fact that better results are likely to follow sucessive sowings upon the same land. But in any case it must be borne in mind that artificial inoculation of the seed will supply only one of the necessary conditions and will not prevent failure from other causes.

CULTIVATION.

Preparation of the Soil.

It is very important that especial attention be given to the preparation of the soil upon which it is proposed to sow alfalfa. Not being provided with creeping roots or stems, the plants will not spread as is the case with such grasses as Kentucky bluegrass or Bermuda grass. The individual plants become larger each year by the increasing size of the crown, but bare spaces in a field will not be filled in except as new seed may be sown. Furthermore, the young alfalfa plant is quite tender and is easily crowded aside or choked out by weeds or checked in its growth by lack of moisture or by other unfavorable conditions. For these reasons it is highly desirable that a perfect stand be obtained by the original seeding.

Supply of plant food.— The soil conditions required for the best growth of alfalfa have already been pointed out. Assuming these conditions, it is still necessary that the soil should be fairly free from weeds, especially such as are known to interfere seriously with alfalfa. In case the soil from overcropping or natural sterility, is not sufficiently fertle, it will be necessary to add fertilizer in some form. It is, therefore, desireable to commence the preparation of the soil at least a year previous to sowing the alfalfa need. The preceding crop should be one which requires ing the alfalfa seed. The preceding crop should be one which requires cultivation such as corn cotton, or roots. The rotation may be such that if the alfalfa is sown in the fall there is time in the summer to plow the land and allow it to lie fallow. The weeds may then be destroyed as they germinate, by occasional harrowings. Although alfalfa can obtain its supply of nitrogen from the air when the plants are well started, it is necessary that the soil should contain plenty of this element at the time of sowing, in order to start the young plants with a vigorous growth. The fertilizer which will accomplish the purpose most quickly and most satisfactorily is good barnyard manure, free from weed seeds. It is better to apply this to the land at the time of growing the preceding crop, as the manure than has time to decompose and become available. Barnyard manure not only supplies nitrogen and other elements, but it supplies humus to the soil, and thus places it in a better physical condition. In place of supplying the elements of fertility by an application of manure the nitrogen and humus may be supplied by growing a suitable leguminous crop, such as red clover or Canada field peas in the North, cowpeas or soy beans in the South. The foregoing may be summoned up in the statement that the soil should be fertile and free from weeds.

Plowing and Harrowing.—The mechanical preparation of the soil immediately preceding sowing depends much on its condition. For best results the field should be prepared as for a garden. There are localities in the western half of the United States where the soil is of such a nature that plowing is not necessary, especially if the fieuld can be irrigated; but in the Eastern States plowing, thorough harrowing, and the use of the disk, roller, or plank according to circumstances is to be advised. Subsoiling has been recommended but this is usually unnecessary. In the dry regions, where the subsoil is compact, subsoiling will increase the water-holding capacity of the soil. If the soil is wet by rain after being prepared, and is then harrowed as soon as it can be worked, there should result an excellent seed bed to receive the alfalfa.

It is not best to sow aifalfa on freshly plowed land, for a loose seed bed is unfavorable to the young plants. One or two good rains before seeding improve the condition of the seed bed. It should, of course, be harrowed as soon as in condition after each rain, to keep it from baking before seeding. Alfalfa should not be sown on a field that has just had a green crop turned under. Time should be allowed for the new material to decay and for the acid to be worked out by one or two good rains.

TIME FOR SOWING.

In the Northern States and in the irrigated regions of the West, alfalfa is usually sown in the spring. As has been pointed out, one of the greatest enemies of young alfalfa is weeds, and spring sown alfalfa is more likely to be choked out during the summer by weedy grasses, such as crab grass, than is that sown in the summer. Toward the northern limit of the alfalfa belt, however, the seasons are shorter and the plants may not be sufficiently started to survive the winter in case the seeding is done in the fall. Furthermore, the time of sowing is likely to be influenced by the rotation of crops practiced on the farm. Where a spring crop can be grown and removed in time to allow the sowing of alfalfa in the summer there is no loss of the use of the soil; but in the far North this does not give the alfalfa sufficient time to prepare for winter.

SOWING WITH A NURSE CROP.

As a usual thing, at least from the standpoint of the alfalfa crop, it is best to sow the alfalfa alone; but it is customary in many localities to sow with grain. If the conditions are well suited to the growth of alfalfa the stand may not be materially injured, and there is gained the crop of grain; also the weeds are kept down while the alfalfa is getting started. Usually, however, there is a loss of alfalfa, the resulting stand being less satisfactory than when the alfalfa is sown alone. Whether this loss is sufficiently compensated by the grain crop must be decided by the grower. If the crop of alfalfa the second year is as good as if it had been sown alone the grain crop has been gained where the sowing was done in the spring; but if the stand is injured such a gain would not compensate for this loss, as a poor stand can rarely be improved. Beardless barley has been recommended for use in the Eastern States where a nurse crop is often satisfactory. Whatever grain used the sowing should be comparatively light, so as not to smother the alfalfa. If the grain crop threatens to be too heavy it should be mowed for hay.

AMOUNT OF SEED AND METHOD OF SOWING.

The seed may be sown broadcast or with a grain drill. The drill has the advantage of distributing the seed more evenly over the surface than is likely to be the case with hand sowing and of placing the seed at a uniform depth. It has the disadvantage of placing the seed too deep unless special precautions are taken. If drilling is employed in moist soil the shoes should barely touch the soil. The seed is then covered sufficiently by the chain, wheel, or other accessory that follows the shoe.

Where alfalfa is sown broadcast it is best to use a mechanical sower, such as a wheelbarrow seeder, as the seed is distributed more evenly. The seed should be well harrowed in, or it may be cover by means of a plank drag.

The amount of seed usually recommended is 20 pounds per acre when sown broadcast, and a less quantity (about 15 pounds) when sown with a drill. If the seed is of good quality, the soil in fine tilth, and the conditions for germination are favorable, less than 20 pounds may suffice. Under exceptional conditions successful stands have been obtained with 5 or 6 pounds. Some growers use more than 20 pounds even 30 or 35 pounds, but this amount seems excessive, and should be used only when necessary to counteract the effect of poorly prepared soil or other unfavorable conditions. Although a thick stand may be an advantage in choking out weeds, yet for the development and subsequent vigor of the plants, it is better to have a thinner but uniform stand. The individual plants then have room to develop a strong crown with the accompanying extensive root system.

TREATMENT OF AN ALFALFA FIELD THE FIRST SEASON.

During the first season following spring sowing the field should be clipped with a moving machine at intervals to keep down weeds, if the latter show a tendency to choke out the alfalfa. If this is not necessary and the alfalfa has made a vigorous growth, a light crop of hay may be obtained, or under favorable conditions even a second crop. Usually, however, returns can not be expected the first season from spring sowing, without irrigation, except in the South. In irrigated districts one of even two or three crops may be obtained the first season. Some growers pasture during the fall after seeding. This is not to be recommended as it almost always injuries the stand either by trampling or the close grazing. When alfalfa is sown in the spring with a nurse crop no attention may be necessary after cutting the grain except to clip the weeds if these become troublesome. In clipping to keep down weeds the cutter bar of the mover should be set high, as the seedling plants are injured by close clipping.

It is very important, praticularly in the Northern States, to allow alfalfa to go into the winter with a good growth—at least six inches high If cut to late in the fall to grow a good winter covering it is very apt to suffer from winter killing.

SUBSEQUENT TREATMENT OF ALFALFA FIELD.

Although in most parts of the country alfalfa does not reach its maximum development until the third or fourth season, yet the treatment after the first season is similar from year to year. Alfalfa is primarily a hay crop, although it is used in some locolities and under certain conditions for soiling, for silage, for a cover crop in orchards, and for pasturage.

If a good stand is obtained from the original sowing no further treatment should be necessary after the first season except to cut the hay at the proper time. If from any cause the alfalfa should die out in spots, or if the original stand was not uniform, or the fiield should require rejuvenating after a few years because of the compact sod, the best remedy for any of these difficulties is a thorough disking in the spring, the disks being set so as to split the crowns vertically. Seed may be sown in the bare spots either before disking or after; if sown after, the field should be harrowed. If a field is in bad condition, it is usually best to plow up and re-seed. Many growers recommend disking every spring, even when the stand is good, and some have found it a paying practice to disk after each cutting. Such disking will often prevent the encroachment of weeks.

ALFALFA FOR HAY.

CUTTING.

Alfalfa should be cut just as it is beginning to bloom. After the beginning of the flowering period the hay deteriorates rapidly in nutritive value. If the field is fairly uniform, the proper stage for cutting is when about one-tenth of the plants have reached the flowering period. The number of cuttings varies in the North from two to three. The yield is from 1 to 2 tons per cutting, the first cutting being usually the largest, but the yield per cutting, especially for cuttings after the first, is usually less when there are several cuttings. In the alfalfa regions of the country the aggregate yield of hay is, under favorable conditions, usually from 5 to 8 tons per acre. It is customary in many localities to pasture the fields more or less after the last cutting.

CURING.

In regions where alfalfa is irrigated there is usually no difficulty in curing the hay; but in regions where rain may occur during the haying season, great care is necessary to produce well-cured hay of good color. Rains or even heavy dews spoil the color, changing it from the bright green demanded by the market to a yellow or brown. Discolored hay may not be less nitritious for feed but is less valuable upon the market.

The harvesting should take place with as little handling as possible in order to prevent the shattering of the leaves, which contain a large proportion of the nourishment.

Handling in the field.—The preparation of hay from alfalfa is essentially the same as for any of the grasses, being modifield somewhat by its succulent nature, especially in the humid regions. On a commercial scale the cutting is done by mowing machines drawn by from two or four horses. The mowing should be commended in the morning. In the arid regions the making of hay from alfalfa is a very simple process. The air is so dry that the hay moved in the morning may be raked and stacked in the afternoon of the same day, but in the more humid climates the difficulties increase. There is more moisture in the air, the green alfalfa is more succulent, and the curing process must extend over a greater length of time. There is additional danger of heavy showers or dews wetting the hay before it is dry enough to place in the stacks or barns. Where the alfalfa is expecially succulent the curing process must be hastened by the use of a hay tedder.,These machines are now in use in many places along the lower Mississippi and Red River valleys. When the hay is sufficiently dry it is raked in windrows and later thrown into bunches or cocks. In regions where heavy dews prevail and the curing will not be completed on the day the hay is cut, it is often advantageous to rake the partically cured hay into windrows at night and open out these bunches by hand upon the advent of favorable weather. It is often sufficient to throw the partially cured hay into tall narrow cocks, and allow them to remain until the hay is thoroughly cured. Such cocks should be as small as possible in porportion to the height in order that there may be a circulation of air and less danger from heating.

STACKING.

Throughout the western half of the United States alfalfa hay is commonly stored in stacks in the field. Alfalfa stacks will not shed water as readily as stacks of grass hay. In the arid regions there is little danger from rains during the season of storage, but in humid climates it is necessary to store the hay in barns or else cover the stacks with large tarpaulins, or they may be topped with grass; otherwise the percentage of waste is very large. In many cases there is likely to be some waste for which reason the stacks are made large, thus reducing the proportionate amount of waste. In the alfalfa regions of the West the stacks are as high as the hay can be handled easily and may be 200 feet or more in length. The size of the stack is then limited chiefly by the convenience in bringing the hay from the surrounding field. The hay may be pitched onto wagons, drawn to the stacks, and unloaded by hand or by means of various mechanical devices. The method in most common use, however, for transporting hay from the field to the stack is by using some form of hay sweep or, as it is called in many localities, "go-devil.".

BALING.

As is customary with all kinds of hay requiring transportation, alfalfa is pressed into bales when prepared for the market. The convenience in handling is such that alfalfa is frequently baled for local consumption. The hay for baling must be well cured or there is danger of loss from heating and subsequent spoiling.

PASTURING ALFALFA.

In all the alfalfa districts the fields are used more or less extensively for pasturing various kinds of stock. In the arid regions it is quite a common practice to pasture the fields after the last cutting during a portion of the fall and winter. Alfalfa is undoubtedly a valuable pasture plant, but must be used with some caution to prevent loss from bloating, in the case of cattle or sheep, and to prevent injury to the alfalfa field from trampling or overgrazing. Cattle and sheep will bloat as readily upon green alfalfa as upon clover.

Alfalfa is preminently adapted to the production of hay, and except in the case of hogs its use as pasture is secondary. Where it is intended to use alfalfa primarily as a pasture plant for cattle, sheep, or horses, better results may be obtained by combining the alfalfa with some grass, such as brome grass in the Northwestern States. The mixture is a more nearly balanced ration, gives a greater variety of feed, and is less likely to cause bloat.

DANGER OF BLOATING.

The cause of bloat is not known nor are the conditions bringing it about entirely understood. The danger of loss from this cause is always present whenever alfalfa is pastured with cattle or sheep. The loss from bloat in regions where alfalfa is regularly pastured is ordinarily small, although in some cases it is said to amount to as much as 5 per cent per annum. This loss is more than offset by the increased gain from pasturing, even for the limited time in the fall when the pasturing usually occurrs, unless, of course, the animals are especially valuable. The conditions which usually cause bloat in cattle or sheep when fed upon clover it is sometimes claimed, do not seem to be identical with those causing bloat when alfalfa is pastured. In some regions it is claimed by stockmen that bloat is more likely to occur when cattle are turned upon wet alfalfa, or when they are turned into a pasture when hungry. In other regions stockmen insist that these conditions have little or nothing to do with the prevalence of bloat. While there is always danger from bloat in pastauring alfalfa, it may be cut and fed green as a soiling plant with comparative little danger. But there are even cases on record where cattle, on the return of appetite after being off fed, have bloated up on alfalfa hay.

DANGER OF OVERPASTURING.

On the other hand an alfalfa field must not be overpastured. As previously stated the plants lack creeping roots or stems by which to spread and cannot fill in spots where the alfalfa has died. The close grazing, especially of sheep, and the trampling of large numbers of animals, is certain to injure the stand of alfalfa. While the pasturing of alfalfa in the fall may do no harn, it must be remembered that in the warmer portions of the country this season is one of recuperation for the alfalfa plant. If not allowed to make some growth during this period it may not be in condition to start up well the following spring.

PASTURE FOR HOGS, HORSES AND POULTRY.

Alfalfa is an ideal pasture plant for hogs. There is no danger from bloat and with a limited number of hogs there is practically no injury to the alfalfa field. Vigorous alfalfa will support 15 to 25 head of pigs per acre. It is best to limit the number of pigs to that which will be insufficient to keep down an alfalfa field. Cuttings of hay may then be made at intervals and the growth thus rejuvenated. On the average pigs weighing 30 to 60 pounds in the spring will make a gain of about 100 pounds each during the season. Although pigs may be grown and fattened on alfalfa alone, it is best to combine the alfalfa with some kind of grain ration. Alfalfa by itself it too rich in protein to give a balanced ration. Where pigs are pastured upon alfalfa alone they may be prepared for market by feeding for a few weeks on corn. It is still better, howeer, to feed a third to a half of a ration of corn or other grain during the time of pasturing.

The pasturing of hogs may be accomplished by having more than one field into which the hogs may be turned. By pasturing these fields in rotation the alfalfa is given a chance to start and a larger number of hogs may be pastured without injury to the field.

Alfalfa is frequently used as pasture for horses, although the animals should not be confined too closely to this feed. Poultry do well upon alfalfa, and it is recommended that a small patch be available to them in all cases where this crop grows successfully.

FORM AND COLOR AND ADULTERATION OF SEED.

Alfalfa seeds resemble those of red clover in size, but differ in not being so uniform in shape. The color should be a light olive-green Darkened, shriveled and discolored seed should be discarded. On account of the high price of alfalfa seed during the last two or three years a considerable quantity has been imported from Europe. Many samples of the imported seed have been found to be mixed with the seed of dodder, an enemy of alfalfa, which is described in a separate paragraph. The commonest adulterants of alfalfa seed are the seed of yellow trefoil (*Medicago lupulina*) and bur clover (*Madicago maculata and M. denticulata.*) The plants of yellow trefoil and bur clover are easily distinguished from alfalfa by their smaller size and their yellow flowers. It is not often that home-grown alfalfa seed is adulterated. It sometimes occurs, however, that unadulterated seed is of a poor quality, as shown by its brown color as contrasted with the light olive-green of good seed. Such seed should be discarded, as its germination is low.

FEEDING VALUE OF ALFALFA.

It is well known that alfalfa is a highly nutritious and palatable fodder for all classes of farm animals. All Kinds of stock eat it greedily, either in the form of green alfalfa or as hay. Below are given tables showing percentage composition, digestibility, and the digestible nutrients in 100 pounds of green alfalfa and alfalfa hay, is each case compared with red clover.

Average percentage composition of alfalfa.

Condition of Forage	No. of Analyses.	Water.	Ash.	Protein.	Crude Fiber.	Nitrogen free Extract	Ether Extract (Fat).
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Fresh alfalfa	23	71.8	2 7	4.8	7.4	12.3	1.0
Fresh clover .	43	70.8	2.1	4.4	8 1	13.5	1.1
Alfalfa hay	21	8.4	7.4	14.3	25.0	42 7	2.2
Clover hay	38	15.3	6.2	12.3	24 8	38.1	3.3

Average digestibility of alfalfa and red clover, percentage.

(Experiments with ruminants.)

Condition of Forage.	Number of Analyses.	Protein.	Crude Fiber.	Nitrogen Free Extract.	Ether Extract (Fat)
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Fresh alfalfa	2	81	45	76	52
Fresh clover	2	97	53	78	65
Alfalfa hay	28	73	43	66	54
Clover hay	46	55	49	69	53

Digestible nutrients in 100 pounds.

Condition of Forage.	Dry matter in 100 Pounds.	Digestible Nutrients in 100 Pounds.		
		Protein.	Carbohydrates.	Ether Extract.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Fresh alfalfa	28.2	3.9	12.7	0.5
Fresh clover	29.2	2.9	14.8	0.7
Alfalfa hay	91.6	10.44	39.6	1.2
Clover hay	84.7	6.8	35.8	1.7

The leaves of alfalfa are richer than the stems in protein, carbohydrates, and fat, but are poorer in crude fiber. The Colorado station has shown that protein in the two cases is 13.12 and 8.61 while the digestible protein is 9.84 and 6.46 parts in 100 parts of dry matter. It is therefore quite essential that alfalfa hay should be put up with as little loss of leaves as possible.

Good bright alfalfa hay that has not been wet by rains or dew is more valuable for feed than that which has been damaged by water. It has been shown that where good hay contained 18.75 per cent protein in the water-free material, the same hay damaged by rains contained only 11.01 per cent protein.

RELATION TO OTHER FEEDING STUFFS.

Need of grain as a balance.—It will be seen that alfalfa is even more nutritious than clover. On account of its high percentage of protein it is not a balanced ration. For the best results the alfalfa should be combined with some other feed which is rich in carbohydrates. While animals may be fed and even fattened for the market upon alfalfa alone, nevertheless a portion of the nutritive value of the alfalfa is lost in this way. The alfalfa does not give the best results. In order to balance the ration alfalfa should be combined with a suitable quantity of grain. This grain may be corn or barley, according to the availability of each.

Alfalfa as a dairy feed.—As an illustration of feeding alfalfa alone, may be mentioned the case of the dairy farms in the vicinity of Moneta, Cal., where the stock are ordinarily fed no other ration than alfalfa. Since alfalfa is not a balanced ration a number of local dairymen tried to replace a part of the alfalfa by sorghum, thus giving a more nearly balanced ration. The cows, however, did not give as much milk upon this combination as upon pure alfalfa. This result may be assigned to the fact that the cattle were unable to consume a sufficient quantity of the mixture to produce the same results as the alfalfa alone. These dairymen find they can secure a larger milk-yield by feeding a little grain; but the increased yield does not pay for the grain, which is high priced in this locality.

EXPERIMENTS IN FEEDING ALFALFA.

Pigs in Nebraska.—Pig-feeding experiments carried on at the Nebraska Experiment Station with corn and alfalfa hay showed that the cheapest gains were made by means of corn and chopped alfalfa. In this combination the cheapest gains were made where the ration was three-fourths corn and one-fourth alfalfa, but where the alfalfa was raised on the farm and there was no particular need of hastening the growth of the pigs, it was found that cheaper gains were made with one-half alfalfa and one half corn.

Cattle and hogs in Kansas.—At the Kansas Experiment Station cattle fed upon a ration of corn and alfalfa hay gained much more than others fed upon other rations. During the one hundred and fifty-three days of the test the value of the gains made by the different lots were: Corn and alfalfa hay, $109.74; barley and alfalfa, $57.16; wheat and alfalfa, $44.91; corn and sorghum, $27.09; corn and prairie hay, $56.96; corn and oat straw, $43.28. At the same station hogs were fed on a ration of alfalfa hay and Kafir corn meal. The gains were seventy-three per cent more on this ration than upon a ration of Kafir corn meal alone. For every bushel of Kafir corn meal 7183 pounds of alfalfa hay the gain was 10.88 pounds, while upon Kafir corn meal alone the gain was 7:48 pounds per bushel. It is shown that the hay gave better results when cut early and that the chief nutriment was in the leaves, which should be carefuly saved during the process of harvesting. An earlier experiment at the same station was tried to determine the value of alfalfa pasture for hogs. The hogs were allowed to run upon the alfalfa during the summer and were fed a light ration of grain. After deducting the probable gain for the corn it was found that during the summer each acre of alfalfa pasture produced 776 pounds of pork.

Steers in Utah.—At the Utah experiment station steers made a most rapid gain when fed upon early-cut alfalfa either with or without an accompanying ration of grain. By early-cut hay was meant hay cut just before bloom. The gain upon this early cut alfalfa hay was one third more than upon hay cut when in full bloom or later. It was also found that more hay was produced from the early cuttings and that the third crop gave more rapid gains than either the first or second, which latter are nearly equal in this respect.

ALFALFA FOR HORSES.

There is no doubt that alfalfa is an excellent forage plant for horses, both as pasture and as hay. Horses do well upon alfalfa pasture, but care must be exercised that they do not injure the stand of alfalfa by trampling or too close grazing. In the alfalfa regions of the West work horses upon the farm may be fed the year round upon no other ration than alfalfa. It is, however, generally conceded that horses, while heavily worked, should receive at least a small grain ration in order to produce the maximum effect. This is especially true of livery horses and those which are worked upon the road. On the other hand there is a prejudice against alfalfa as feed for horses which is largely due to unfamiliarity with this kind of hay. Horses as well as other ainamls may not take alfalfa hay readily until they have acquired a taste for it. It has also been found that injurious effects may follow a sudden change to alfalfa hay from some other kind of feed. This seems to be due to the large proportion of protein which may overstimulate the animal. There are also certain other reasons why alfalfa is objected to by horse men. The manure is softer and more liquid than from animals fed upon timothy hay and it is more difficult to keep the animals and the stables clean. It is a fact, however, that the use of alfalfa hay for horses is rapidly increasing.

ENEMIES OF ALFALFA.

WEEDS.

One of the most important factors in hindering the development of alfalfa on soil suited to its growth is the presence of weeds. Alfalfa is quite tender when it first comes up and the young plants are easily crowded out by weeds. The weeds may appear about the same time as the alfalfa and thus prevent the latter from obtaining a start. If the conditions are favorable for the growth of alfalfa, a weedy field may often be saved by frequent clipping with a mowing machine.

Squirrel tail and similar grasses.—Squirrel tail grass (*Hordeum jubatum.*) also called foxtail in Wyoming, barley grass in Utah, and tickle grass in Nevada, is a common weed in the Great Basin region; and another species (*Hordeum murinum*) called wild barley, barley grass, and foxtail, is common on the Pacific slope. The common dandelion is troublesome in parts of Utah and Idaho. In the limestone regions of the Northeastern States bluegrass encroaches seriously upon alfalfa fields. Old fields that become weedy are often benefited by disking in the spring and after the cuttings are made. Alfalfa has no method of propagation by creeping roots or stems and consequently the plants do not spread, but the disking kills the weeds and splits the crowns of some of the alfalfa plants vertically, rejuvenating them. Seed sown upon the vacant areas at such a time may improve the stand. Where the weeds succeed in obtaining the upper hand it is best to plow up the field and reseed it.

Field of Fall sown Alfalfa just before first cutting, June 10, 1904. On grounds of the Iowa Experiment Station, Ames, Iowa.
(Reproduced by courtesy of Successful Farmer.)

ALFALFA.

J. G. HANEY OF IOWA AGRICULTURAL COLLEGE IN WALLACE'S FARMER.

Alfalfa at the present time seems to be claiming the attention of many farmers of Iowa and other states of the more humid regions. It has been supposed that alfalfa is adapted to only the arid regions. Professor Bailey, of Cornell University, in speaking of alfalfa as a forage crop gives the impression that it is only a crop for the "semi arid" plains and must be supplied with moisture by irragation. The reason for its being grown so largely in the region mentioned is because it withstands the dry seasons better than other crops. It does not follow, however, that this characteristic disqualifies it for such a climate as Iowa has.

To successfully grow alfalfa requires experience that can be had only by growing it, or attempting to grow it. Experience in handling other crops is valuable only in a general way. The most essential step in obtaining a knowledge of the subject is to become convinced of the merits of the crop and know that it is needed on the farm.

Alfalfa may be compared to clover hay, though it is much better for feeding purposes. The leaves of alfalfa hay, which if properly handled, constitute a relatively large per cent of the crop are more valuable, pound for pound, than bran. The plant is a perennial—lives from year to year—and if properly handled produces three or four cuttings a year for as many years as desired. The seed is no harder to obtain than clover, and if properly understood, should be no harder to seed and secure a catch. When the hay is secured and has been properly cured it will constitute an important part of the winter ration of every animal and fowl on the farm. Stock—hogs, cattle, colts, and horses not at heavy work sheep etc.—if fed onehalf to onethird of the ordinary ration of alfalfa and the other part of good hay or fodder, will do better than if they get only common hay or fodder (excepting clover) and corn. Bright alfalfa hay chopped fine, mixed with one fourth its weight of meal, placed in a tub or barrel, moistened with hot water, covered and allowed to steam will come nearer making the hens lay thirty-cent eggs in January and February than any other common feed. It is also unexcelled as a soiling crop for all kinds of stock, and as a pasture for hogs. But it is not safe to pasture cattle or sheep on it as is often produces bloat.

Alfalfa does not work into the rotation as well as clover because when a setting is secured it should be left five to eight years. It does not reach its best until the second or third year. The root system of alfalfa is wonderful. The roots go down much deeper than those of ordinary crops. The writer has dug up alfalfa plants six months old with roots six and a half feet long, that had gone down into the ground six feet. On old plants these roots become one to two inches in diameter so when the field is plowed up these roots are very beneficial. Not only because of the material that is in the roots, but as they decay the ground is left porous so that air and water can enter the soil more readily. Alfalfa, like clover, enriches the soil because it furnishes a home for the bacteria that are able to make air nitrogen available for plants.

The alfalfa plant while young, like other plants that start from small seeds, is quite tender and must be given very favorable conditions. A very carefully prepared seed bed is essential. "A deeply plowed and well harrowed" seed bed is the kind that alfalfa does not want. It is the writer's opinion that the plow, when run deep in preparing land for alfalfa, has been the cause of more failures than any other one thing. Alfalfa wants has a solid seed bed. The first root that alfalfa sends out grows down, and it wants to find good solid soil very soon. The young plant begins to take its first food from the soil immediately surrounding the seed. It this has recently been turned up from way down deep, the plant food in it is not in condition to be utilized.

In humid regions, owing to the prevalence of weeds, it is usually found most satisfactory to seed in late summer. The ideal plan would be to give the ground an ordinary plowing in the spring and then by frequent shallow cultivations retain the moisture and keep the weeds down until the 10th or 15th of August, and then seed. If spring seeding is to be tried, the land should be fall plowed and put into good condition.

Alfalfa will doubtless be successful on the average Iowa soil that has good drainage. It should never be sown on land subject to overflow or that is flat and slow in draining and drying off.

Alfalfa should not be seeded with any other crop. If seeded in the spring it is absolutely essential that it be mowed several times during the first summer. No crop of hay is expected from alfalfa the first season, but it must be mowed or it will bloom, go to seed, and die, or be so weakened that it will not survive the winter. The mowings should be frequent enough so that whatever weeds and alfalfa are cut may be left on the field as a mulch. If the best results are to be obtained alfalfa should not be allowed to produce seed until at least three years old. It is cut for hay when one half in bloom. Fall seeding may not need to be mowed, but if any blooms appear, or if the weeds make too vigorous a growth, the mower should be used. The mower should not run too close. One to two inches above ground is a safe height to cut.

The securing of seed is also very important. Seed grown in the irrigated districts should not be used in the humid sections. Alfalfa adapts its habits to conditions very readily, though not instantaneously. When possible, seed should be secured from a locality very similar to that in which it is to be sown.

AN ALFALFA CATECHISM.

F. M. Kopping, Pottawattamie County, in Wallace's Farmer.

Below I will give as briefly as possible my experience in alfalfa growing, and if you deem it worthy a place in your valuable journal you are at liberty to publish it. I will put it in the shape of questions and answers, as follows:

Q. What kind of soil or land will raise alfalfa?

A. Most any land, provided it is not too low and wet, which has been well tilled and is apparently free from weeds.

Q. How should the ground be prepared?

A. If corn was grown on the land the preceding year the stalks should be thoroughly broken, raked, and burned. Then take the disk and pulverize the ground, then harrow, doing the latter about once a week until ready to sow your seed. If fall plowed land is intended for the seeding the same course may be followed.

Q. Why would it not be better to plow cornstalk ground instead of disking?

A. Because by so doing the soil would not be so firm underneath nor perhaps quite so fine and mellow on top. I have tried both ways at different times, and disking has always given me the best results.

Q. When should alfalfa be sown?

A. Any time from the 20th of April to the first of June; about the middle of May would perhaps be the best time.

Q. How much seed should be sown per acre?

A. On well prepared ground twelve to fifteen pounds is sufficient. I have never sown more than twelve pounds, and have always secured a good stand. Of course, the above applies to first-class seed only; no other should be used.

Q. Should the seed be sown alone or with a nurse crop?

A. I would advise sowing with a nurse crop, say a bushel and a half of oats per acre. Then pasture in the following manner: Let the oats or whatever you may sow for a nurse crop grow up about eight inches, then turn your cattle on—sheep would be better—for three or four hours each day or as often as is necessary to keep the cover crop in check. By all means keep stock off of alfalfa in wet weather, for they will tramp the ground up and killed tiny plants.

Q. How long should pasturing be continued?

A. This depends somewhat on the season. However, I would not advise to continue later than August 10th. In a dry season the first of August would be better.

Q. Should the growth from that time on be left on the ground or a crop of hay taken off?

A. By all means leave it stand on the ground, as good covering for winter protection, is of vital importance, especially the first year. In an experiment which I conducted I found that the plot with good winter protection gave a far heavier yield the following year than the plot where a crop of hay was taken off although the latter had a coat of good barn yard manure, eight loads per acre put on with a spreader, applied to it in March.

Q. What is considered a good stand of alfalfa?

A. If the plants are eight inches apart each way or even more than that you need not worry about a poor stand. It will surprise you after a few years.

Q. Will the stand improve or, in other words, will it get thicker after the first year?

A. Yes, but not after the same fashion as clover will, by reseeding itself. Alfalfa will send out shoots or runners from the main stem for twelve inches or more. These shoots, roots, or runners, will in turn send up sprouts, and in this way cover and occupy the ground which would—were this not the case—otherwise be vacant.

Q. Is it necessary to inoculate the soil with alfalfa bacteria?

A. In this part of the state (southwestern Iowa), no. In most other parts a liberal application of good barn yard manure well worked into the soil will, I think, be inoculation enough.

Q. When should alfalfa be cut?

A. When it begins to bloom. It would be a great mistake to cut in later than the early blooming period, as new shoots begin to make their appearance at this time, and they should be given full possession of the ground?

Q. How should the hay be cured?

A. The best way in my estimation, is to rake it as soon as this can be done, then put it in rather small, high cocks. Leave it stand in these cocks until well enough cured so it won't get dusty and moldy in the shed or barn. By following the above method you will secure hay of first quality.

Q. How often can it be cut in a season?

A. Three times in this part of the state.

Q. How many tons of hay will it yield per acre?

A. In an ordinary or average season it will yield at least five tons to the acre and very often more. I secured over a hundred tons of hay last year from twenty acres, besides pasturing eighty head of hogs on it all summer. My hogs are almost living on it now. I turned them out the first of the month.

Now a few general remarks: The foregoing may perhaps lead some of your readers to think that if they can only raise a big piece of alfalfa it is all they need. I would caution all those to go slow, sow a small piece the first year, and add to it as they learn more about this, the most valuable forage plant a kind Providence has blessed us with. There is a great deal about growing and handling alfalfa which cannot be learned in any other way than by actual experience. I would however, advise everyone to try it in a small way unless he knows absolutely certain that it will not grow in his locality. And I furthermore believe that alfalfa can be grown over a great deal larger territory than it is now grown on. It is grown here on the Missouri river gumbo soil as well as on the steepest hillsides, and seems to be at home in both places.

GROWING ALFALFA IN NORTHERN IOWA.

Twentieth Century Farmer.

Question often comes to this office asking whether alfalfa can be grown to advantage in the northern part of Iowa. Many farmers have an idea that alfalfa cannot be profitably grown in sections east of the Missouri river because the climate is too moist. By the time the first alfalfa crop is ready to be cut for hay considerable rain usually falls in nothern Iowa, and consequently it is difficult to cure the first crop and make good hay of it. But we do not believe that to be a sufficient argument against the use of that crop. We do not better at this time than to refer to the experience of S. A. Roeder, whose farm is located some three miles north of Sioux City. Mr. Roeder has been growing alfalfa in that locality for a number of years. Last year he puchased more land and part of this he put into alfalfa. The farm had been rented for several years, and as is often the case in instances of that kind, had not been properly cared for. It was very weedy. On a fifteen-acre field, which had grown a large crop of weeds for three or four years in succession he planted corn, but after the corn was well up he concluded that it would be impracticable to keep the weeds down, and consequently he plowed up the whole field, disced it thoroughly and harrowed it several times. In other words, he prepared what he calls an ideal seed bed for alfalfa and what he terms an ideal seed bed is nothing short of what a market gardener would consider a perfect garden loam.

He seeded twenty pounds of alfalfa seed per acre about the first of April and during the first season, that is, last summer he cut three tons of hay per acre off from these fifteen acres. This was secured in two cuttings and shows in a very striking manner that there is certainly no reason why alfalfa should not be grown in Iowa wherever the soil is adapted for this legume. True this alfalfa has not gone through cold weather yet, but Mr. Roeder has several fields that have been seeded for a number of years and he has never had any trouble from its freezing out.

Whenever thin spots occur in his alfalfa fields he goes over them in the spring of the year and scatters a little seed. In case the patches are large, he sometimes uses the disc first, then puts on the seed and finally uses a light harrow. It should be stated in this connection that the alfalfa referred to was seeded without a nurse crop. Ordinarily when alfalfa is seeded in that manner and in the spring of the year it does not produce enough to make it worth while cutting the crop for hay. This is no doubt partially due to improper seed bed preparation. The fact cannot be too strongly emphasized, that the soil should be thoroughly prepared for alfalfa, that the plants are very slow growers at first, and that consequently there is danger of their being crowded out by weeds. In order to prevent this, the custom of clipping the crop at intervals during the summer season with the mower is practiced with satisfactory results.

We call attention to this matter at this time of the year so that farmers may be thinking about purchasing the necessary seed, should they decide to seed a patch of alfalfa next spring. Alafalfa seed is not very abundant, and we would advise prospective growers to purchase seed as early as possible, thereby securing the best in the market.

FIRST-YEAR ALFALFA IN INDIANA.

C. M. Ginther, Wayne County, Indiana in Breeders' Gazette.

The past season has proved beyond any doubt that alfalfa may be grown profitably in many states east of the Missouri River, which stream constituted an imaginary dead line beyond which the wonderfully prolific crop could not be grown. From reports issued by the Department of Agriculture the information is derived that alfalfa has been grown in every state and territory and experiments have been carried on in the newly acquied possessions. It seems that the crop is as adaptable as prolific, and when it has once obtained a start is practically everlasting and a sure producer.

Farmers generally, and with good reason, prefer to hear about the actual achievements of men engaged in the business of practical farming rather than to be referred to something the powerful and resourceful Department of Agriculture has done. Practical farmers all over the country have had their minds turned toward alfalfa during the past year, and most of them have decided to undertake to grow the crop. But they fear they will fail, for it has been truly said that alfalfa is one of the hardest of crops to get started. In common with every other crop farmers have come to look upon alfalfa as demanding no more than its due, for if the ground is carefully prepared and the seed of proper quality the outcome is practically certain. Up-to-date farmers no longer trust their precious seed in ground which has been carelessly and improperly prepared. The theory is accepted that land preparation is essential to success. Therefore alfalfa no longer need be looked upon as a crop of peculiarly delicate tendencies, but merely like any other crop whose successful start defines and foreshadows future harvests. Alfalfa costs more than clover to start, and this has been urged against the adoption of the crop as a substitute for clover, but after it has once been successfully started its productiveness far more than offsets the first cost. Farmers who want to raise alfalfa may do so no matter where they live, but they must make up their minds to do the work right, which means thoroughly. No halfway means will do with alfalfa, for it requires careful treatment as long as it is immature. After that stage in its growth is reached it may be left for years with little or no attention.

Many farmers started to raise the crop last spring and many of them failed. Their crops were either choked by weeds or else failed to survive after having started apparently well. Investigation of the failures invariably revealed carlessness in some essential particular. To enumerate the causes of all the failures investigated and from which reports have been received would be merely to reiterate the story of almost any individual case. Failure to prepare the seed bed in a proper way is the commonest cause of failure. There is absolutely no use to try to raise alfalfa unless the seed bed has been prepared with the greatest care. Farmers everywhere ought to know just what constitutes a proper seed bed. No doubt most of them could define a good seed bed and actually prepare one, but when it comes to making one they have preferred to stop short of excellence. To prepare a good seed bed the ground must be broken at a time when it is in fit condition for breaking. Then it must be worked with a harrow, drag, disc and roller until it is as fine as powder on top and packed smooth and compact in every part. Then it is ready for the seed, and nc matter what kind of seed is to be planted it will pay every time to have the seed bed in perfect condition.

This season has already advanced far enough to disprove one of the favorite arguments against alfalfa, which is that nothing can be realized from it the first year. Many persons who have given the subject consideration have not agreed entirely with this proposition, but were not in position to disprove it frm actual experience. Happily the discussion can now be set at rest, for an Indiana farmer has succeeded in cutting three ton per acre from alfalfa which was sown on May 20 last. This farmer is Alva Langston, whose farm is in Henry Co., Ind. Mr. Langston has been growing alfalfa for three years, and with others believed that the crop should be clipped as often as required the first year but not removed from the field. This year, however, he was urged to make an experiment with the view of harvesting crops the first year. Early in May he broke up a five acre tract and got it in the best possible condition for the reception of seed. Half of the tract he gave a heavy dressing of barnyard manure, but the other half received no dressing. He purchased seed in Illinois and obtained nitro-culture with which to treat the seed. After the most careful preparation of the seed with the bacterial treatment Mr. Langston sowed the seed thirty pounds to the acre May 20 last. In the operation of sowing he went over the ground twice, once each way, which served to place the seed more evenly over the ground. After the seeding was finished he harrowed the tract lightly and then rolled it. The stand was perfect, so far as could be observed. The growth showed a little more luxurious where the dressing had been applied, but not as much as might have been expected. The crop grew astonishingly, and on July 20 it was large enough to clip. The mower was run over the field and the young plants left to lie on the ground. There were but few weeds. The crop flourished and on Aug. 25 the plants stood on an average of twenty-six inches high all over the five acres. It was decided to mow that crop and save it for hay. This was done and the yield was slightly more than one ton to the acre. A second crop will be harvested as soon as it has grown sufficiently and after that the tract will be pastured. Some of the plants from this field were pulled up by the roots. The roots were fifteen inches long while the plants measured twenty-six inches. This is believed to be the only instance in the country where alfalfa has been successfully grown for a harvest crop the first year. There is no doubt that it is entirely practicable for farmers to set out to plant alfalfa with the expectation of securing valuable returns within three months from the time of planting. In order to realize this, however, it is absolutely necessary to observe every precaution. Mr. Langston observed every step of the growth with care, and he gives it as his opinion that the seed must be of the very best obtainable. It must be inoculated, as without bacteria there is no doubt his crop could not have made such astonishing headway the first season. The remarkable effect of the bacteria is best evidenced by the fact that the crop showed comparatively even all over the tract, both where the manure had been applied and where it had been missed. This shows with unmistakable proof the efficacy of the bacteria in forwarding the growth of alfalfa.

Another theory was destroyed by Mr. Langston's experiment this year, and that is that alfalfa connot be cured outside of the irrigated districts so that it will retain the beautiful green which it possessed when growing. This crop cured green, and when dry as chaff possessed as beautiful and vivid a color as when growing. It is one of the claims of the alfalfa grower in the irrigated country that alfalfa grown there and which cures green retains from eight to fifteen percent more protein, the great food property of alfalfa, than the bleached crop. Whether this claim regarding protein is strictly true or not matters little, for there seems to be no way of controlling the color in curing, but if Mr. Langston's theory is correct, that the crop cured green because of the effect of the bacteria having caused such prolific growth, the conclusion is suggestive. It nevertheless is a fact that his crop cured green and remains so after having been placed in the mow.

SUMMARY OF THE EXPERIMENTS CONDUCTED AT THE WISCONSIN STATION FOR GROWING ALFALFA IN WISCONSIN.

1. Alfalfa can be grown successfully under proper conditions in all counties of Wisconsin.
2. It thrives best on well-drained soils that are underlaid with a gravelly subsoil.
3. Care must be exercised in a thorough preparation of seed-bed.
4. Seed of known vitality sown at the rate of at least 20 pounds per acre, is sufficient to obtain a good stand.
5. If the land on which the alfalfa seed is sown is inclined to be weedy, use a nurse crop; barley sown about three pecks to the acre has given best results.
6. If the field of alfalfa becomes "patchy" and the plants are crowded with white clover, June grass, etc., it is better to plow the whole field in he fall and re-seed in the spring than to attempt to re-seed small patches.
7. There seems to be an advantage in sowing alfalfa on ground that has grown alfalfa before, as the accumulation of alfalfa bacteria in the soil will at once aid the new plants.

8. In this section of Wisconsin, under favorable conditions, occasionally one cutting of alfalfa can be secured the same season of sowing. No attempt should be made to cut alfalfa later than the middle of September, as a sufficient growth cannot be secured after that period to afford proper winter protection.

9. Alfalfa fields that are to be used for the production of alfalfa hay should not be pastured, as pasturing will injure the growth of the alfalfa plants, nor should the crop be cut too close to the ground at the time of harvesting.

10. Hay caps are essential in curing alfalfa hay especially the first crop, as they protect it from rain, dew and sunshine, each of which acts in a detrimental way on alfalfa after cutting.

11 On the Station farm the American variety of alfalfa has equalled in every respect the so-called Turkestan variety; the seed is less expensive and free from noxious weed seeds.

On practically all plots where the Turkestan alfalfa seed was sown by members of the experiment association, European mustard plants were found during the growing period, showing that the seed was impure. There seems to be no advantage in sowing the Turkestan variety, as its origin is of doubtful character and it seems quite conclusive that the major portion of the Turkestan alfalfa seed sold is so in name only.

12. All farm animals eat green alfalfa and alfalfa hay with a relish and do well on it.

Alfalfa has about the same feeding value as wheat bran and may be considered as an equal to that feed for dairy cattle and other farm animals.

ADULTERATION OF ALFALFA AND RED CLOVER SEED.

CIRCULAR FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE.

Seeds of alfalfa and red clover have been obtained and tested in accordance with the following paragraph in the act of Congress making appropriations for the Department of Agriculture: ,

"The Secretary of Agriculture is hereby directed to obtain in the open market samples of seeds of grass, clover, or alfalfa, tests the same, and if any such seeds are found to be adulterated or misbranded, or any seeds of Canada blue-grass (Poa compressa) are obtained under any other name than Canada blue-grass or Poa compressa to publish the results of the tests, together with the names of the persons by whom the seeds were offered for sale."

In carrying out the provisions of this act, 1,272 seedsmen were asked by special agents of this department for samples of red clover and alfalfa seed, as offered for sale by them. From these seedsmen 658 samples were obtained and examined. As a result the following lots were purchased in open market and found to be adulterated. In accordance with the mandatory nature of the act quoted above, publication is here made of the names and addresses of the seedsmen who sold the lots found to be adulterated, together with the percentages of adulteration in each lot.

In order to aid seedsmen in avoiding the purchase of adulterated seeds, this Department will examine and report promptly as to the presence of adulterants in any samples of seed submitted for that purpose.

SEED SOLD AS RED CLOVER BY—	Seeds used as Adulterants.	
	Yellow Trefoil.	Total Adulterants.
	Per cent.	*Per cent.*
Rawson & Co., W. W., 12 and 13 Faneuil Hall Square, Boston, Mass	10.55	10.55
Ross Bros., 90 and 92 Front street, Worcester, Mass	26.85	26.85
Small & Co., W. H., 7 and 9 Upper First street, Evansville, Ind	14.08	14.08

SEED SOLD AS ALFALFA BY—.	Seeds used as Adulterants.			
	Sweet Clover.	Bur Clover.	Yellow Trefoil.	Total Adulterants.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Barrett Co., The W. E., 65-87 Canal street, Providence, R. I.		3.47	32.86	36.33
Barteldes & Co., 1521 Fifteenth street, Denver, Col		16.86		16.86
Crossman Bros., 503 Monroe avenue, Rochester, N. Y.		5.02	39.48	44.50
Dallwig, W. E., 34 Juneau avenue, Milwaukee, Wis.		5.74		5.74
Everitt, J. A., 227 West Washington street, Indianapolis, Ind.		4.27	38.43	42.70
Everitt, J. A., 227 West Washington street, Indianapolis, Ind.		3.90	39.53	43.43
Gregory & Son, James J. H., Marblehead, Mass.		3.00		3.00
Grossman, W., 15 Bollingbrook street, Petersburg, Va			1.25	1.25
Hamilton Bros., Cedar Rapids, Ia.		5.49		5.49
Huntington & Page, 130 East Market street, Indianapolis, Ind.		3.37	38.54	41.91
Kirchner, Jacob F., 156 North street, Pittsfield, Mass.	9.52			9.52
McMillan Seed Co., L. D., 23 South Broad street, Atlanta, Ga..		10.04		10.04
Martin, B. E., Main and Walnut streets, Salem, Ill.			6.98	6.98
May & Co., L. L., 381 and 383 Minnesota street, St. Paul, Minn.			31.77	31.77
National Seed Co., 101 West Main street, Louisville, Ky.		16.53		16.53
Platt Co., The Frank S., 374 and 376 State street, New Haven, Conn.		5.88	39.85	45.73
Rush Park Seed Co., Independence, Iowa..		12.69		12.69
Steckler Seed Co., Ltd., J., 518-526 Gravier street, New Orleans, La.		2.57	.63	3.20
Young & Halstead, Foot of Grand street, Troy, N. Y.		6.23	31.26	37.49

TIME TO CUT HAY.

PROF. W. J. KENNEDY OF IOWA EXPERIMENT STATION IN BREEDER'S GAZETTE

Answering the inquiry:

"When is the best time to cut timothy and clover to make hay for stock feeding? At what period in its growth is it likely to have the most nourishment after it is cured? If the grass is allowed to become too ripe before cutting, do we lose much of its net value, energy and tissue making properties as a food?" I would say:

That a large number of farmers lose a considerable portion of the feeding value of their timothy and clover, due to cutting either too early or too late, cannot be questioned. From the standpoint of stock feeding, the period of growth which furnishes the greatest amount of dry matter in the hay per acre may not be the most profitable time to cut it. In addition to the question of total quantity, both the palatability and the digestibility of the food must be given due consideration, the former influencing, as it does, the amount consumed and the readiness with which the animal will eat the food being thus responsible for waste that is left in the feed rack; while the latter controls, in a measure at least, the amount consumed by the animal, which is digested and capable of absorption, and so used in the maintenance and building up of the system.

The best time to cut either timothy or clover hay for stock purposes is at that period in the growth when the greatest amount of digestible dry matter can be obtained in its most palatable form. Total dry matter alone is not a safe guide, as the results of several tests indicate very clearly that while the total amount of dry matter in timothy may increase from the period of full bloom until dead ripe, the digestibility of the same is markedly lower, and the palatability of the food almost entirely gone. With clover hay the total amount of dry matter does not increase very much after full bloom, as in the process of curing a portion of the leaves is lost and the more mature the plant the greater is this loss.

The following extended tests, an average of three years made at the university of Maine with timothy hay, is worthy of study in this connection, as it exemplifies the changes in the different stages of the growth of the plant, showing the yield of dry matter per acre:

Stage of growth.	*Yield per acre in lbs.*
Nearly in head	3,720
Full bloom	4,072
Out of bloom or nearly ripe	4,136
Ripe	3,832

While the total amount of dry matter per acre increased until the timothy was nearly ripe, it does not follow that the food improved from the standpoint of stock feeding. It is available food nutrients that are of value to the stockman. If this additional weight is composed of material which is not so digestible it may be of little or no value for feeding purposes. As a rule, plants increase in woody fiber as they ripen and so decrease somewhat from the standpoint of digestibility.

The following analyses made at the Connecticut Experiment Station of timothy grass are of interest in this connection:

Stage of Growth.	Ash.	Protein.	Crude Fiber.	Nitrogen Free Extract	Fat.
Well headed out	4.7	9.6	33	50 8	1.9
In full blossom	4.3	7.1	33.3	53.3	2.
Out of blossom	4.1	7.1	33.8	53.3	1.7
Nearly ripe	3.6	6.8	35 4	52.2	2.

These analyses show very clearly that not only does the percent of crude fiber increase with maturity but that the per cent of both protein and ash decreases, while that of the soluble carbohydrates is hard to determine. That these changes influence the digestion of the hay is well illustrated by the American digestion experiments, which show the average digestibility of the organic matter of timothy hay cut in bloom or before bloom to be about 61.5 per cent, while that of the timothy cut after bloom is 55.4 per cent. Using this as a basis of comparison, the yield of digestive organic matter per acre would be in full bloom, 2,306 pounds, and when out of bloom or nearly ripe, 2,350 pounds. If we take into consideration the loss in palatability due to increased fiber and lack of aroma, the advantage is clearly with the early cut hay.

In case of clover hay the advantage is still more in favor of the early cutting. This is true not only of the amount of digestible organic matter and the advantage from the standpoint of digestibility, but also in total pounds of dry matter per acre. The following test, made by the Pennsylvania State College with red clover, is of interest in this connection, as showing the yield of dry matter per acre:

Stage of growth.	*Pounds.*
In full bloom	3,680
Some heads dead	3,428
Heads all dead	3,361

This loss in dry matter is very likely due to the shedding of the leaves in the curing of the hay.

All points considered from the standpoint of the feeding value of timothy and clover, the best results will usually be obtained when these crops are cut in that period of growth designated as full bloom. If cut at an earlier stage, difficulty will be experienced in curing and the yield per acre of dry matter will not be so great. The only possible advantage to be derived from earlier cutting is in the palatability of the hay. If allowed to mature after the full bloom stage in the case of timothy, a greater yield of dry matter per acre will be secured, while the digestibility and palatability of the hay will be reduced. In the case of clover hay which is allowed to stand after the full bloom period of its growth has been reached, it not only loses in digestibility and palatability, but also in total dry matter per acre.

SEEDING CLOVER IN CORN.

DAVID BROWN OF DODGE COUNTY, NEBRASKA, IN BREEDERS GAZETTE.

I promised to tell what I find better than a rape crop. I do not despise a crop of rape. I have grown it with success and profit, and where I did not know better I was highly pleased with it. It may be better for many to grow and more suitable for them than the crop I am growing now; different conditions make other requirements.

In working the cornfield to be seeded to clover it is necessary that the cultivation be level. There is no difficulty in doing this with the implements now in use in cultivating corn. Have the ground clean and free from weeds when the corn comes up and at the time of first cultivation. This can be done best by the free use of the harrow. If the harrow or weeder be used there will be no weeds in the hill that would require the dirt thrown onto the hill to cover them. Hence level cultivation is all that will be required to keep the hills clean. We use a six-tooth cultivator, cultivating three times. If we then have time we take a one-horse cultivator with seven to 12 teeth and go through the corn before seeding. This is to make the surface fine and free from any unevenness that would allow a clover seed to go deeper than one and one-half inches. Keep in mind that clover seed will not sprout if covered too deep. If the surface is sufficiently fine and smooth it does not require this extra going over after the cultivator before sowing, but just sow and go over with the one-horse cultivator after seeding to cover the seed to a depth not to exceed one and one-half inches. The past two seasons our seeding has been done from July 15 to 20, and the clover was ready to turn sheep onto by Oct. 1, being about four to six inches high. We have seeded with 10 pounds of clover and five pounds of timothy. The timothy is for the purpose of giving a closer bottom and variety for pasture, to hold up the clover while growing and keep it loose to dry out better when the crop is cut for hay. Last summer we seeded with five pounds of mammoth, three pounds common, one pound alsike, one pound alfalfa and five pounds timothy. The stand is all that could be desired. The alfalfa was put in in order to spread the alfalfa germ, so that in case we wished to seed to alfalfa the bacteria would be in the ground.

The presence of the cornstalks would be considered a drawback. We simply break them down early in spring with a heavy harrow, then watch our opportunity some time about the middle of April when the stalks are dry and cross again with the harrow. This breaks up thoroughly the stalks and leaves them flat on the ground. Any places where the first harrowing left the stalks bunched these bunches are scattered by the second harrowing. In harvesting the crop some stalks will be taken up especially if a steel rake is used. This is very little inconvenience if the hay is handled by machinery, and there is no loss if the crop is to be fed out on the farm, but if an adjustable side rake is used no stalks need be lifted by the loader.

Seeding is done while cultivating the corn crop. The corn crop is benefitted by the finer tillage done in covering the seed. The young clover plants form a low gentle covering for the ground among the corn and do not draw heavily on the supply of moisture in the ground as weeds do but rather prevent evaporation by their close leafiness. Rape is often so rank by husking time that it is very unpleasant to work in the field, especially if wet or frosted. The clover is low and there is no inconvenience whatever. Lambs will feed in a clover cornfield before the corn crop is gathered and not interfere with the corn, so they can be turned in to feed before and while husking the corn crop. It furnishes fall and winter pasture for sheep and lambs. In pasturing they eat some husks along with the clover and when the ground becomes covered with snow they betake themselves to the corn leaves and husks. All spring seeding is avoided and time can be used to attend to young stock that is coming at that season. It allows mares that are having foals a better time and more suitable feed. The crop is ready to harvest as soon as a fall wheat crop would have been and much surer. There is no twine bill to pay and no threshing machine to follow. A second crop can be harvested in the fall that can be used as a seed crop. The second season this can be used as a pasture until time to break up in April for a corn crop again.

Thus you see the rotation: In corn from April to October; pasture October to April; hay two crops, one for feed and one for seed; then pasture until broken up for corn the second spring thereafter, making a rotation for three years of six months to grow a corn crop, fall and winter pasture for sheep, one summer for hay and 18 months for pasture, or as much of that 18 months as stock can be allowed on it. Only one season's cultivation is necessary and one seeding in three years. A constant enrichment of the soil results. Increased yields of corn are secured. Decreased labor and incraesed returns follow.

At first thought one would think that with such inducements so many would turn to this line of farming that it would soon be overdone. But when I consider the conditions I am forced to conclude otherwise. To do this a farm must be managed as a stock farm exclusively. A man must have a liking for and an adaptability to stock raising or he can not make it a success. If he lives in town away from the farm he must have a competent man to attend to it. There is an uncertainty of retaining competent hired help. A renter cannot do it unless he leases for a number of years, better not less than 10. Few men having farms to rent would be willing to take into consideration the increased enriching of the land as a part of their returns but it is there and cannot be taken away by the renter when he leaves. The number of farms rented is increasing annually; most of them are on yearly lease and under these conditions a three years' rotation would be impossible, so to those who can do this and are willing to stand by it there is an opportunity that will have only limited competition.

RAPE IN STUBBLE.

W. F. KELLEY BEFORE SOUTH DAKOTA SHEEP BREEDERS' ASSOCIATION.

The rape plant is so generally known that it is not necessary for me to give much of a description of it. Webster places it with the cabbage tribe. He also speaks of it as resembling a turnip. It seems to be a cross between the two plants, partaking somewhat of the nature of both. It is eaten greedily by all kinds of farm animals, but seems particularly adapted for sheep.

South Dakota is placed in the semi-arid belt. We in the eastern part of the state resent being placed there, but we must admit that it gets very dry here sometimes.

In the early part of the growing season there is a very rapid growth of all kinds of grasses, both native and domestic, but too often it happens, in the latter part of the season, that our pastures wither and dry under the burning suns of July and August. Then, and from that time on clear through the autumn months, it seems a positive necessity that we should have some green, succulent food to take the place of our withered pastures if we get the growth on our lambs that we should.

In the eastern states during this period they practice a system of soiling. In the spring they sow oats and peas together; later they sow or drill in corn or sorghum, and go out each day and mow sufficient for the needs of that day, thereby tiding them over the dry period.

But that plan seems to slow for the farmer of South Dakota; our farms are too large. Farm help is too scarce and high priced to admit of us trying that plan. South Dakota will undoubtedly come to that, but the time is not yet ripe, and for the present we think there is a better and an easier way, and that is by sowing rape seed in our grain fields in the spring, to be pastured off after the grain is harvested and stacked. We have been practicing this plan for some years with the best results. I presume many of my hearers have already tried sowing rape with grain. I do not presume to teach these people anything on this subject, but to those that have not tried it, with their permission, I will give my experience with rape in stubble.

I would choose a grain field, and let it be a large one, that I intended planting to corn the following year. Then you need not plow until spring, thus giving the sheep the run of the field the entire fall. I would sow ten acres of that field by mixing the rape seed with the first grain that is sown in the spring at the rate of two and one-half to three pounds to the acre, but do not sow it this early with barley, for if you do so the chances are that you will harvest more rape than barley. I would sow the rest of the field anywhere from the 15th to the 25th of May, going over the field thus sown with a light harrow.

Do not be afraid of damaging the grain by harrowing it, for I assure you you will not, but the very opposite will be the result. You will benefit your grain, you will kill very many weeds and cover your rape seed at the same time. That's killing three birds with one stone. I will admit that after harrowing your grain your field will look bad. It will look as though it had lost its last friend, and you will probably curse Kelly for advising you to try such a plan, but just you wait a few days, and see that grain field get right down and hump itself and grow. If it does not do this, if I were you, I would never buy a Rambouillet ram of Kelly.

My reason for sowing ten acres with the grain is this, that acreage will make a rapid growth and furnish an abundance of feed, even if the late summer should prove to be very dry, but I would not care to risk sowing the whole field then, because if the season should prove favorable for the growth of rape it might make such a strong growth that it would be nearly as high as the grain and bother like everything at stacking time.

I remember once, some years ago, I sowed some rape with oats, and I was obliged to go over the field and knock down every shock so the wind and sun might dry out the rape that was in the butts of the bundles, but that oat straw with the dried rape in it was, next to the alfalfa hay, the finest sheep fodder I ever fed.

The rape seed sown in May will usually be from four to eight inches high at harvest time. The sickle will sometimes snip off a few leaves, but not enough to make any difference with stacking the grain, and unless the season be very dry will make a rapid growth after the grain is cut, and by the time stacking is done will be one solid mass of green, the finest sheep pasture in the world. My friends, your sheep will feed upon this in preference to the earlier sown rape, but will attack that later in the season. With this pasture you need have no fear of stunting your lambs, but they will swell and grow and your heart will be glad at sight of them.

In first turning in the sheep in the rape you will need to be careful, but there is not so much danger of bloat as is generally supposed. Before turning in I would fill them on some kind of food they will relish. They must not be turned in the rape when they are hungry. I would leave them in the rape an hour or an hour and a half the first day. I would follow the same course the second and third days, only the third day I would let down the bars, and I would not put them up again the entire fall. I would give them free access to the rape field all day, and all night, too, for that matter, if the wolves or dogs do not bother. I have not lost but one sheep by bloat since following this plan.

I believe there could be a large profit made by the farmers of eastern South Dakota by sowing their entire grain fields to rape in this manner, then go out on the range west of the Missouri and buy a car load or two of lambs, according to the rape you may have. I would buy in August, let them feed on the rape in the stubble the entire fall, then as a supplement I would have a few acres of raps sown in the cornfield, fence those acres of rape from the rest of corn, turn in the lambs and let them harvest rape and corn together, load them and take them with you to the International and sell them for Christmas mutton. If there was a premium on the best car load of lambs you would stand a good show of capturing it.

I repeat that I believe there would be a large profit in this for the farmer of eastern South Dakota.

SOWING RAPE IN CORN.

M. F. MILLER OF UNIVERSITY OF MISSOURI IN BREEDER'S GAZETTE.

Rape may be sown in the corn just before the last cultivation with good results if the soil and season are favorable. If there is plenty of moisture during the latter part of summer, if the soil is a good corn soil, and if the corn is not too rank, a large amount of forage may be secured. Rape is a plant that is considerably affected by the fertility of the soil and if a soil is thin the plants do not make a satisfactory growth especially when sown in the corn. If the soil brings fair corn, however, it will be sufficiently rich for the rape to make a good growth and an abundance of forage for the fall months. If the season is dry little growth from the rape may be expected, although even then it will suffice to keep down weeds and give some return for the seed and sowing.

Rape is usually sown in this way at the rate of about three pounds of seed per acre. It is most easily sown horseback, scattering broadcast by hand. It may, however, be sown with the ordinary broadcast hand grass seeder. The cultivation which follows should not be too deep, as the seed does not require deep covering if the ground is moist. The cultivation which should be usually given corn in laying-by should be shallow and would be well suited to covering the rape seed. The sowing may also be done with a one-horse drill, sowing at the rate of two pounds per acre. The diffiiculty with the method is in getting a drill that will put on the required amount.

Rape makes excellent forage for hogs and sheep especially, when sown in this way, and where oats follow corn in the rotation it is a most valuable crop.

HOW TO GROW SORGHUM.

WALLACES' FARMER.

We are having a great many letters as to how to grow sorghum to the best advantage. We have stated this in language as plain as we know how many times in the past two or three years; and will beg the pardon of our older readers for saying it once more.

First: Take good, rich, well drained land, say land that was in corn last year. Cut off your corn stalks and disk as soon as the frost is well out of the ground. Disk again, disk every week or two until about the first week in June in the latitude of Des Moines, earlier south of that, later north. If you have a piece of good land that for any reason you do not desire to put in corn again, or which you can't get in until too late to plant corn, then take this in preference. In all cases prepare a good seed bed. Then sow sixty pounds of germinable seed per acre. (It will probably require a hundred pounds of seed that is purchased. Test it and find out.) Cover with a light harrow, aiming not to get it any deeper than necessary to secure moisture. Then forget about it.

North of the latitude of central Iowa use the Early Amber; in the southern part of our territory use the Collier, for the reason that it stands up better than the Early Amber. As we say, forget about it until the heads have turned brown; in other words, until the sorghum head is ripe. Then if you sow broadcast, mow and put in the largest cocks you possibly can, twice as large as you think they ought to be. Then forget about it again until you are ready to use it. Don't try to cure it. Don't wait until it gets very dry. Unless you have more help than most farmers have, you may commence within a few hours after the mower. You will be far enough behind before you get through.

West of the Missouri many farmers drill it in either by using a corn drill or the corn planter and splitting the rows. Sown in that way not more than fifteen or twenty pounds of germinable seed is necessary. They then cut it with the corn binder or grain binder and put it in shock. Others use the grain drill, stopping up part of the holes, so as to have a width sorghum that can be taken in easily with the grain binder, and put it in shock. The objection to putting it in shock in the more humid sections is that it is more likely to mold about the bend.

Hence we advice broadcast sowing in central and eastern Iowa. The experience of farmers is the best guide in the western part of Iowa and west of the Missouri river.

We hope that our readers who are interested in this matter will read this article carefully, remembering what we say, and also what we don't say, and then use their own judgment as to the principles laid down, profiting by the experience of their neighbors who have been using this valuable crop. Remember that sorghum is much better feed than timothy for dairy cows and young stock, quite as good as corn fodder; that it is a ration to be given to dairy cows only; when balanced with nitrogenous feed; that it can be used with great advantage in carrying all kinds of young stock through the winter. We are feeding four or five hundred tons of it ourselves this year, and our young cattle prefer good sorghum to inferior alfalfa.

H---Miscellaneous Topics.

OUR COUNTRY ROADS

J. F. GRAWE, WAVERLY, IA., BEFORE BUTLER CO. FARMER'S INSTITUTE.

I wish I could feel that I was here with a message that was helpful, that would help us all to get out of the mud.

The tax payers of Bremer county will pay, this year, into the County Road Fund, $4,800; into the Bridge Fund, $14,400; and into the Township Road Fund, $14,547—a total of $33,747 to build roads. During the coming ten years,, the people of Bremer county will pay about $300,000 for road and bridge work.

The tax payers of Chickasaw county will pay this year into the County Road Fund, $4,461; into the Township Road Fund, $16,210; into the Bridge Fund, $17,849—a total of $38,520. In ten years the tax payers of Chickasaw county will pay about $385,000 to build roads and bridges.

The tax payers of Butler county will pay this year into the County Road Fund $6,282; into the County Bridge Fund $25,144 and into the Township Road Fund, $17,212—a total of $48,642 to build roads. In ten years Butler county tax payers will pay about $486, 420 to improve the roads.

During the coming ten years the tax payers of Bremer, Butler and Chickasaw counties will pay about $1,171,420 to improve the highways and bridges.

Surely the people have a right to expect that when this money is expended, the roads and bridges will be better than they are now. Surely some permanent good ought to be accomplished with this money.

All admit that good roads would bring money and comfort to all, and cause and appreciation of the values of land. A country may be as rich as the Garden of Eden, but if ingress and egress are difficult, its full possibilities will never be developed. Not only is this true in a material way, but it is true in all ways. A community in which travel is an arduous task, loses in a material way, and in an intellectual and social way as well. To keep abreast of the world, we must rub ideas with our neighbors. The farm that is difficult to reach is not so valuable as the one that is easily reached.

Trade seeks the line of least resistance. A community must offer itself. A county may be gridironed with railroads, but if the rations on them are hard to reach from the dwellings of the farmers neither the merchants, nor those stations nor the farmers themselves, will be greatly benefited.

If all the roads into Waverly were made so good that big loads could be hauled over them easily, for 365 days each year, it would do more good than all the breweries and saloons you can crowd into the town. Good roads will attract people our way. The profit coming from good roads will exceed the cost of making them.

The Waverly Industrial Association could not do a better thing than to take hold of this problem and secure practical men to devise the best plan for carrying out a systematic and practical campaign for good roads to the business center of the city.

The more the work is concentrated under one man and this man held responsible for the proper ependiture of the fund, the more economical will be the administration, provided the proper man is selected in the first place.

Take one of the most important roads and develop it: make it as good as possible with the means at hand. Do as much as you can this year, and again next. The road north over the Stockwell bridge in Waverly ought to be improved. It ought to be rounded up, covered with clay, or soil without sand. Then put crushed rock or gravel on the driveway. It is practical. Gravel and crushed rock are near. The City can afford to do this; in fact she can not afford to not do it. Improve a hundred rods or more in this way and several hundred farmers in LaFayette, Warren, Polk and Douglas townships will say to you: "Well done, good and faithful servants". This can be done with the city's share of the one mill County Road Fund.

Commence in the city and make a good road to the city limits. Then from that point, build each year, as many rods as the fund will stand, and continue on that line to show what can be done by systematic efforts.

Roads that are always in good condition have such a vital bearing on the industrial, and general phases of life, that they have an important influence on the welfare of all our people. Good roads are worth while.

The business of improving the roads should be put on a business basis.

Every good citizen should feel that he has responsibility in this matter, and guard against the incompetence of officers selected to perform these duties.

Every citizen should realize that the office of township trustee is an important office. The best men in the township are none too good for the office of township trustee. They appoint or let to the lowest responible bidder to work the roads in their district. The trustees are the masters of the situation so far as the road superintendent is concerned. The trustees can discharge him if he does not comply with the contract. It is the trustees' duty to see that the road superintendent performs his work according to law and contract. Remember that trustees cannot contract with themselves, or appoint one of their own members to do the work of the road superintendent. Some telephone people have set their poles five or six feet from the fence line into the road. Trustees should not allow this. It is a violation of law for telephone companies to construct their lines so that the poles or fixtures incommode the public in the use of any road. When poles are set in the road they intrefere with the cutting of weeds. Poles should be set on the fence line.

The road superintendent is an important officer, and his pay should depend on whether he does the work or not.

Three good trustees in every township and twenty good road superintendents in the county can do the people of this county more good next season than the governor of Iowa or "Teddy" Roosevelt.

Ninety-five per cent of all products carried by the railroads are first hauled over the country roads. Why are the railroads so much interested in spreading the gospel of good wagon roads? It is because they believe their revenue will be increased when the railways are made more accessible by means of good wăgon roads over which farmers can easily haul their products.

If there is a problem in urgent need of solution it is the road problem. Everybody knows that to macadamize would end the trouble, but the day when so expensive a solution as that may be applied, generally, is distant, and the advent of a cheaper and more practicable method in the meantime, will be hailed with delight. We expend too much time and horse flesh getting over buggy roads.

Iowa spends about $4,000,000 a year on the roads. A large part of this is used in a hap-hazard way.

To do effective road work the road must first be drained and graded. The water must have a chance to run off, then if it is kept smooth with a road drag that will level the bumps and fill up the holes and ruts, the water will run off quickly after each rain.

Drainage is the first step. Our attention, for the present, at least, must be confined to grading up the roads and then keeping them in shape, so the water will run off quickly. Make the surface so that it will shed water into gutters. Make gutters so that they will discharge water in the quickest possible time. Make he road bed so that water can not stand on it and the most difficult problem will be solved.

Macadamized or brick roads are so expensive that we can not give that method much attention at this time. But we can make a convex surface to facilitate drainage. And if we keep this convex surface smooth we accomplish a good deal for comfort in travel.

Our earth roads require constant care. They can not be built and left for the season. If we make the best earth road that can be made and then abandon it, it will soon fall into ruts. "A stich in time saves nine," in making and preserving roads.

Some road superintendents undertake too much. They never finish a job. They commence to work a piece of road and leave it before it is finished. It is generally better not to tear up a road if you can not finish the job. You have found "worked" roads left as rough as lava beds. It is hard to get to Heaven or anywhere else over that kind of roads.

Dirt Road made good with the Split-log-Drag.

WALLACES FARMER

Dirt Road made good with a Split-log-Drag.

A number of good jobs of grading were done in Washington township. I want to call attention to the work through what used to be called the "Healy Duck Pond," on the road between Waverly and Shell Rock. What that job still needs is a drainage ditch through the fields south from the pond.

There is a good job of grading south from Bert Fry's in Polk township. The road superintendent did his work pretty well and it was finished with road draggs. During the summer, after rains, Mr. Fry hitched his team to the drag and smoothed and rounded up the grade. In spite of the many rains last summer this road is one of the best, and it used to be one of the roughest.

Road superintendents can sometimes do much good by planning for next year's work. There are roads where a few furrows should be turned over on each side of the road bed so that the sod will rot and thus facilitate the work of grading next year.

Road superintendents should aim to let their light so shine that men may see their good work. A good road worker will see to it that the work is done and then let the work do the talking.

The road should be so worked that the weeds and grass on each side of the track may be cut with the mower. We can not afford to raise weeds on the highways. It is the duty of road supervisors to cause to be cut, near the surface, all weeds on the public roads in their districts between the 15th day of July and the 15th day of August of each year.

We have some conscientious road workers. There are men who have done all that could be done with the means at hand. Don't turn off the road superintendent who did good work last season. His experience will help him to do better work next season. He knows his territory and will be able to do more good than a new man. The poorest road superintendents are those who know it all. Give me the man who never gets too old to learn. Whether we are road superintendents or county supervisors, let us do our best.

At a road meeting in Clayton county two weeks ago nearly every farmer present pledged himself to use a road drag during the coming season and asked for a copy of a phamplet, "Good Roads Problem in Iowa," which is issued by the State Highway Commission at Ames, who will send a copy to any one who writes for it. The fact is, before much is accomplished, the people must become desperately in earnest.

The road drag is a good tool for the purpose for which it is intended. There has been nothing devised that does the work needed on our dirt roads better than the cheap road drag. After the road is properly graded and drained, the road drag used at the proper time will preserve the grade and keep the road bed smooth and hard so that water will run off.

The usefulness of the drag depends upon weather and conditions of the soil. The first time use it when quite wet. After that the road should be dry enough so that some loose dirt can be moved. I have said that convexity, smoothness and hardness are necessary to make good dirt roads. These conditions combined provide drainage, without which there can be no good dirt roads.

There is a good job of grading in Washington township west from E. L. Booth's, to the C. G. W. Railway; and, by the way, Mr. Booth is responsible for some of its goodness. He used the drag last summer. Whenever it is possible to get gravel near by the driveway should be covered with gravel. Some good has been done in this way to roads in Jackson, LaFayette and Washington townships.

The proper use of the road drag will keep the grade smooth, which will distribute travel over more surface, and thus avoid ruts and holes that hold water and make mud. The drag should be used repeatedly and systematically to produce satisfactory results.

I do not claim that the drag will do the work of the grader but after you have built a grade and provided drainage, the drag presses and packs the earth into the holes and ruts. After the grader has done a good job the road drag, if used, will preserve the grade. You can not do satisfactory work with the road drag on very sandy land, among stumps, or on stony roads. Don't get the idea that the drag is the whole thing. Where water stands along the roadside and in the road bed during four months in the year, the drag will do but little good. There have been seventeen road drags made since last spring for use in the first supervisor district of Bremer county. They cost about $60, and the work done with them, if paid for at $3 a day for man and team would cost about $100. But it did not cost the county over half that amount, because several progressive farmers used the drag to demonstrate its benefits. And these farmers also paid their road tax (some of them without grumbling).

There has been no money expended on the roads in the district that has brought more comfort and satisfaction to those who had to use the roads. Fifteen of the seventeen drags did good work. The other two have not yet made one rod of road better because they have not been used, and these two will never do any good—not even to the extent of a tinkers blank—unless they are used. It is the same with a great many good things. The Golden Rule and the precepts of the Sermon on the Mount are conceded to be very good, but they are entirely useless to any man unless he puts them into practice.

(Since the paper was read at the Institute a bill has passed the Iowa legislature which provides that trustees shall have the road drag used on highways under the direction of the road superintendent when in their judgment the road would be improved thereby. In choice of person to do the work preference shall be given to the occupants of the land abutting. Reasonable compensation shall be allowed for such work, but in no case shall it exceed 50 cents a mile for each time dragged; and there shall be not expended therefore more than $5 per mile for any mile on which said work is done during any one year.)

I hear complaints against the road law. The trouble is not so much with the law as with the administration of the law. The best road laws known to man will not make good roads unless the requirements of the law are carried out. The administration of the law is more important than the law itself. Perhaps there should be changes made in the road laws, but, generally speaking, we tinker too much with the laws; and the tinkering is sometimes done by men who do not know themselves just what they want.

Some objections urged against the law are that townships with seventy-two miles of road to care for often prove too large for satisfactory administration by one man; difficulty is found in securing men with sufficent administrative ability to plan good road work and superintend the labor of other men; minor repairs—a defective culvert or broken plank in the bridge—which repairs should be made quickly and cheaply, --are now sometimes delayed and made more costly by reason of having to notify the road superintendent.

To remedy these defects the average township might be—at the pleasure of the trustees—divided into four districts, and a superintendent appointed for each district. The trustees in Jackson, LaFayette and Washington townships, where the Cedar river divides the township, have worked on this plan by appointing a road superintendent for each side of the river.

One of the best means of keeping public roads in good condition would be the general use of wagons with broad tires for heavy loads. Tests made at the experiment stations prove that the draft on a heavy load is largely in favor of the wide tire. The use of the broad tire is a benefit to the roads. The broad tire rolls and levels the road while the narrow tire cuts them in ruts. Iowa should encourage the use of wide tired wagons. Some states have laws that provide that wagons for heavy loads must have tires four or five inches wide. Some states encourage the use of wide tires, by a rebatement of taxes. At the last session of the Iowa legislature a bill was introduced to encourage the use of wagons with tires not less than three inches in width, allowing a rebate of 25 per cent of the road tax of a person who used such wagons in drawing heavy loads, limiting the rebate in any case to $5. The bill passed the Senate by an almost unanimoums vote,but was defeated in the House. The legislature is considering a similar bill this winter.

Lumber is getting so expensive that we should make culverts and small bridges with concrete. But the concrete floors should be reinforced with iron rods. We have used some old bridge steel, also some railroad rails for reinforcements of cement work. All these are imbedded with the concrete. The side walls of a cement bridge should be down to a solid foundation and every precaution should be taken to protect them from undermining. Some recommend a cement floor to prevent the bottom under the bridge from washing. I do not think much of this extra expense.

The abutments for larger bridges should also be solid masonry or concrete where stones, gravel and sand can be got near by, at fair prices. Stone or concrete abutments and tubular steel piers filled with concrete are better and also cheaper for a foundation in a series of years than the best piling you can buy. Six years ago the people of New York had their attention called to the fact that farm values in that state had shrunk more than 6 per cent, or $70,000,000 in ten years. They found the same shrinkage in other northeastern states, except in Massachusetts, where an increase of over 20 per cent was traced to the fact that the state had liberally improved its roads. Further study showed that in New York 12,000,000 tons of farm products were hauled to market every year over wagon roads at a cost of not less than 16 cent per ton per mile, while over roads properly graded and graveled or macadamized the cost would be from 6 to 8 cents per ton per mile.

The natural roads in New York are better than the average natural roads in Iowa. We pay for our vastly richer soil with dirt roads that are mud when wet. No statistics are at hand to show what the cost of transporting freight per ton per highway mile in Iowa may be, but if it be true, as the experience of Massachusetts is said to make reasonbly sure, that improved roads in New York will enable her farmers to get their products to market 50 per cent cheaper, a like improvement in this state should enable our farmers to make a much larger saving in the same process.

New York has just passed a constitutional amendment which provides for an appropriation of five million dollars annually to be used in improving roads. That there may be an equitable distribution of this money, and to encourage counties and townships to take an interest in good road building, the law specifies that any township that will expend $1,500 in a county that will furnish $3,500 the state will aid it to the amount of $5,000. The plan is the outgrowth of careful study, based on experience, and it seems worthy of the closest study by the people of Iowa.

And if our representatives in Congress would appropriate a few million dollars a year for the improvement of the highways it would do the people more good than the hundreds of million that have been expended or squandered on some "Rivers and Harbors." Congress could help us in a way that would count for good. In New York the autorization of the work is expected to add at least $10 per acre to the value of the farm lands affected.

I believe that for every dollar judiciously invested in making good roads, enhanced values would be counted in scores of dollars within a single lifetime.

There are great possibilities for good on "Our Country Roads," for those who want to do something which will be appreciated by all the people, and for which posterity will call them blessed. We ought to see more permanent good accomplished with the money expended. But we are not going to give up hope.

Let up hope that some patriot will come forward who has planned and worked out a method which, with the money now raised by taxes, will make all our country roads as good, or better, than the best roads are now—a method of working the roads so that they will be good 365 days in every year. Such a man would be a promoter of human good, and there ought to be a monument erected for such a man, and that monument ought to rear its head far above its kind. where the morning's sunbeams that stream over our beautiful Iowa, will first kiss it, and where the evening's golden tints will last dwell upon it.

The discussion which followed was led by Mr. J. M. Heald, of Nashua. Mr. Heald exhibited a model of the road drag used by him the past season in caring for two miles of road near his home. It was the same style as is used in some places in this county, and has been described in most of the papers of Iowa. He said that after a little practice anyone could operate it successfully. He thought that a difference of soil would probably make some difference as to how dry the road should become before the drag should be used; but in his case the work was best done when the road was just dry enough to fill in the ruts and not puddle, or the first wagon over the road would slush the wet ground out of the rut. One would soon learn the best time. He dragged these two miles 13 times at a cost of $7.20 or $3.60 per mile. This had previously been considered one of the worst roads in that section, but this season it was considered the best. The road had but little if any grade at commencement, but was left with a pretty fair grade. Bradford township, in Chickasaw county, expended about $1100 in road work, which is about $13 per mile of road. This shows quite saving by the use of the road drag.

FARMING MOST INDEPENDENT CALLING OPEN TO MANKIND

BY N. C. FOWLER JR. EXCHANGE.

In the world's dictionary the farmer is defined as a plain tiller of soil; and the agriculturist or planter as one who has lifted the farm on to the plane of business. The term farmer, however, covers that vast company of workers who by the planting of the seed raise any kind of a harvest or who breed and raise cattle and other stock. The planter of the south and the agriculturist of the west are both farmers, but by right of courtesy are described by other titles because they carry farming into business, or rather apply the methods of business to planting and harvesting.

The railroad may cease running, and things will continue to live. The stock board may board up its doors and the world will continue to move as it has been moving for centuries, subject only to transient financial cloudiness. Most business may go out of business and the professional money no longer continue to practice,yet the people will continue to live and to propagate. But when there is no longer any farmer there will no longer be any people, for the world will have starved to death.

BUSINESS PRINCIPLES SHOULD OBTAIN.

Not withstanding the existance of hundreds of abandoned farms and the constant exodus from the farm to the city, the farm, in its numerical and financial strength, is today the greatest power in the whole civilized world. The farmer is not recognized as he should be, because he seeks neither notoriety nor prominence, but quitely does his work, allowing others to play at society and to receive its shallow reward. Here, however, has been made a grievous mistake. The farmer, like the lawyer, should be proud of his profession, sufficiently appreciative of it to contribute to it the full measure of his self-respect. Because he does not do so he has lost both the social and business prominence which really belongs to his calling.

Some farms do not pay, partly because some farms cannot be made to pay.The totally barren farm is a worthless piece of property—the sooner abandoned the better. Probably not more than one-half of our fertile farms pay as well as they would pay were the right effort made. Too many farmers, instead of working their farms, allow their farms to work them. The principles of business, the laws of progressive economy, are not applied to the farm as they are to other callings. Consequently, the farmer is not always financially well to do, and usually through no fault of the farm but because he does not exact what he should from it.

The tendency today is unmistakably away from the farm. The farmer's boy, partly because he wants a change, but largely because the great unknown shines with a light apparently brighter than all the lights he has ever seen, desires to leave the farm and to earn his living under entirely different conditions. But the farmer's boy is not altogether to blame for leaving the farm. The fault, in more than half the cases is due to the farmer himself and the way the farm is conducted. The boy, brought up upon the farm which is not properly cultivated, and were most of the work is drudgery, or is made to be drudgery, where intellectual growth is stunted, naturally, in the ignorance of his youth, assumes that all farms are like the farm of his childhood and that the opportunities of life must be elsewhere. Therefore he gravitates to the city.

HARD WORK; MUCH OF IT UNNECESSARY.

Farm work is hard. There is no denying it. The farmer, as much as any other man, earns his living by the work of his hand and by the sweat of his brow. Farmers, as rule, are the hardest of our workers, except the miners. They literally bend to their labors, and many of them bend altogether too much in their assumption that the success of the farm is dependent upon the quantity rather than upon the quality of their work.

If the average farmer works harder than the business man it is not always because he has to, but generally because he thinks he must. The excess of drudgery is usually the fault of the drudge, not of the work itself. So far as the long farm hours are concerned, they are no longer than those required of the majority of men in business for themselves and the members of all professions. The farmer has as much time on his hands, and generally more than does the city business man or professional man. It may seem to him that he works longer, but he does not.

Lack of success in farming, unless the farm be unmistakably barren, generally comes from lack of intelligent application. Altogether too many farmers imagine that success is wholly due to hard and laborious labor. Labor is necessary to any successful result, but the labor in which the mind acts the part of partner is the kind which pays and which does not wear men out.

DRUDGERY CAN BE REDUCED.

Although the average city business man may accumulate more money than the farmer can possibly gain under the moist favorable circumstances, he pays a greater penalty for what he obtains, and in the majority of cases is worse off than is the farmer. If the farmer treated his work as he should, and applied to it the intelligence that is given to other trades, he would reduce the drudgery to a minimum, and ready money would not be a stranger to him.

Nearly all farmers make a living. Comparatively few of course, grow rich from the proceeds of the farm, but more than half of the farmers, whether located on the rocky hills of Maine or on productive western soil, not only make expenses, but are able to save something every year.

The farmer is seldom found in the poorhouse, and from farmers' children have sprung the majority of our great men, both of business and of the professions.

Many a man, who does not know anything about it, and therefore speaks with positiveness, claims that the farmer's life is narrower than all others, and that the farmer has little opportunity to broaden his mind with things which go to make for progress and to better civilization. As a matter of fact, the farmer, unless he is located miles from the heart of progress, has a better opportunity to learn what he should know than has the artificially living cityite, whose broadness consists not so much of the good things, but to an alarming extent of the bad things of life. The city clerk or business man, working in a block and housed in a flat, does not have one-half as much opportunity to progress, in the truest sense of the word, as does the farmer on a fairly fertile farm, working as his own master on his own property.

The farmer above all other men, is independent. If his farm is good for much he knows he can make it give him everything he actually needs.

NO EXCUSE FOR IGNORANCE.

With the modern periodicals and the distribution of every class of reading matter, the farmer has every opportunity for mental development. The education of the progressive farmer is superior to that of the rank and file of metropolitan men of wealth.

There always will be some poor and half starved men among farmers, but this class is far less prominent upon the farm than in the marts of business; and there are ten times more impecunious city workers than there are farmers in actual want.

Should the farm boy remain upon the farm? Upon general principles I say, emphatically, yes! There are exceptions. There are many boys who have no business to stay upon the farm, because they are destined for something not necessarily better, but entirely different from farming; but, generally speaking, I would advise the farmer's boy to remain on the farm unless he can give legitimate, sensible, and positive reasons for a change.

FARM OFFERS HEALTH AND HAPPINESS.

Should the city boy leave the city to become a farmer? Yes, if he wants to. If he goes the chances are that he will become a happier man, a healthier man, and a better citizen; but if he does not want to go, do not force or even urge him. Probably a great many more city boys might go to the county if they only knew the meaning of life in the country. However, there are comparatievly few city boys turn farmers, and it may be a long time before the sense of the city will be strong enough and broad enough to see beyond its brick walls and towering buildings.

The country boy, born and reared upon the farm, should give the farm the preference. Instead of despising his home surroundings because his father did not make a success of farming, he would better use his father's failures as stepping stones to success. The farm which gives the father a mere living may give the son a competency. The farmer's boy should realize that success is not so much how one earns in a year as how much one gets out of the year in experience, money, and opportunity to enjoy life. A few hundred dollars earned on a good farm may leave at the end of the year much more in actual money than five times the amount of earnings will leave to the boy or man in the city.

MORE AGRICULTURAL SCHOOLS NEEDED.

What the world needs today is more intelligent and scientific farming, and more business farmers. There are altogether too few agricultural schools and colleges. The states can do no nobler or higher work for civilization than to establish schools where real farming (not drudgery) as a business is taught. If there is any excuse for government subsides, that excuse should be applied to subsidizing the farming school, which will make not only farmers but business farmers.

I wish the country school, yes even the city school, would instruct the boy in the elements of agriculture, theoretically, if necessary, but in some way instill into his mind the truth about planting and its resulting harvest. We are teaching almost everything in our public schools, both in the city and in the country, to save the one fundamental science of all, the science on which depends our health and wealth—that of agriculture. True, our schools teach botany, but botany is not agriculture in more than a special sense. The so-called school garden is too infrequently seen to make an impression.

TOO MUCH SCHOOLING? HARDLY.

What kind, and how much, school education can the farmer use to advantage? To specify is well nigh impossible. Upon general principles, however, it may be said that there is little likelihood of the farmer, or the would-be farmer, acquiring too much book knowledge. Practically every one is exempt from this danger. In this country there are many successful farmers who are graduates of classical colleges, and this broad education has not injured them, although it may not be have been in every case of financial benefits. If I were forced to answer this question specifically, I would advise the boy who intends to follow agricultural to obtain at least a high school education. I would not advise against a classical college course, but I find it impossible to consider this higher education essential. I advise most emphatically and enthusiastically the boy to attend and graduate from an agricultural college. These institutions, teaching as they do the very essentials of fundamental agriculture, are increasing rapidly, and their grades is growing higher and they are covering more carefully this broad occupation.

INFORMATION EASILY OBTAINED.

If the boy and his parents are not familiar with the location, scope, and requirements of these agricultural institutions information can be obtained from the editor of the local newspaper, the minister, the lawyer, the doctor, or the teacher, or a letter addressed to the secretary of state of any state at the state capital, would either bring full information or would inform the writer where be can obtain it.

Among the principal advantages which agriculture offers to young men is complete independence. The farmer who owns his farm is, if he understands his art, the most independent man on earth. He is in partnership with nature, and with her assistance produces what all the world must have—food. There is a never-ending demand for his products. Then his home is truely his castle, and he may, if he will, make it a haven of comfort and contentment. His hand is his own, and no petty boss or part chief can hald any rod over him that he need fear in the least. Agriculture does not hold forth to the young man the promise of great wealth, but of independence, comfort, peace, and full enjoyment of life.

PROFIT IN ATTENTION TO DETAIL.

HENRY BRAYTON, MANCHESTER IA., BEFORE DELAWARE COUNTY FARMERS INSTITUTE.

From attention to detail comes most of the profit not only on the farm but from every business, everywhere. It is the multitude of little things neglected that spells failure and the careful and intelligent attention to detail that insures success. This includes both plan of the work and system in its execution, for the occasional success of haphazard effort is purely accidental. The man, who studies his business down to the minutest detail and is thus enabled to adopt a plan and system of execution that covers all the ground, wastes less energy and succeeds easier. He is also the man who generally has his work done in season and in the best manner, because there is no wasted energy and all effort is lined up in a steady push toward the end sought. His machinery is ready to use when needed because it has been cleaned up, carefully examined and repaired in advance and kept under cover where it has not deteriorated. Such machinery will not only last longer but will do better execution when in use and the work done by it be a pride, instead of an eyesore.

Attention to detail will provide good seed—clean and true to the best type. Some men that will pay hundreds of dollars for thoroughbred stock, but will plant any old kind of seed. Now that is all wrong; they should extend that attention to detail to the farm seeds and then see to it that the seed bed is properly prepared before the seed is planted; then there will be no need to worry about "What shall the harvest be." Good seed on good ground has always resulted in satisfaction at harvest time. Put more thought on the work, it will save lots of wasted energy. Don't plant a piece of ground to corn until you have it in shape for corn, for it is just as easy to raise fifty bushel per acre as fifteen if you attend to detail with thoroughness and intelligence. The same is true with every one of the farm products. Study to adapt your crops to your soil as well as to fit the soil for the crop. Don't put barley or corn in the slough until it has been drained and warmed up; nor oats after corn where the land is too rich and mellow, not even as a nurse crop to seed down after, because there is a way to seed down to timothy and clover in the corn field if you have plowed your corn so as to leave the ground fairly level. You may sow such seed with an endgate seeder and without injury to the corn, and on heavy land it does not need covering. On lighter soil it is better to cover with harrow made of proper width to go between the rows and one man can drive two harrows just as well as one. This will cut the lodged oats out of the rotation and save all that dread and waste that comes width tangled oats and a crop lost.

I am in hope the manure spreader is going to be a great help also in regard to lodged grain; by spreading the manure more evenly and in lesser quantity we may get a less luxuriant straw growth that will stand up until the grain is ripe. Detail again will take an hour and a magnifying glass and see that the grass seed is a good strong quality and free from the terrible weed pests with which some of it infested in the shape of Canada thistles, horse sorrel, etc., for it is possible at one inadvertence to sow sorrow, eye sore and bachache enough for a life time. Plant good seeds are all along the line for "figs won't grow from thistles," and there is no other harvest but sorrow from bad seed and waste places.

As with the machinery and plants, so with the live stock, only more so, because in addition to looking bad they can feel bad, and neglected detail in the care not only cuts out the profit but makes much unnecessary suffering. Shiftless neglect of the comfort of our animals reduces the profit as it hardens our hearts. A little attention to the ailing ones and to those that have met with accident often saves a useful life and pays in a larger way than mere dollars and cents. It will sweeten up sour natures and let the sunshine in. You are more likely to extend a kindly feeling and a helping hand to the wife and children and your fellowmen, and they in turn may be led to return payment to you in gratitude and care for your comfort—these are the little amenities of life that lead to a reciprocity which a minority of the Senate can never nullify.

Look over the meadows and pastures in April for thin spots and sow them liberally with grass seed. If sown early they will grow up for hay the same season and at haying time you will have one solid mass of grass, the kind that makes three ton per acre. Detail keeps the fences up and saves the damage to crops by trespassing stock and helps to make good neighbors. Good fences also add an air of thrift to a farm, which of itself is a pleasant thing for the farmer and his family to see and with them are no nightly visions of fifty head of cattle holding revelry of destruction in the grain fields, and they will not waken from the nightmare in the morning to find the dream come true.

We ought not to come to the farm yards and buildings last and many men wouldn't. If they had been given proper attention their owner would be so proud of the result that he would want to discuss that phase of the subject first because the house would look comfortable and neat, painted tastefully and reveling in beautiful surroundings, shaded walks, well-kept lawns—brightened up with flowers and shrubs—and in the background a glimpse of well planted garden and orchard, and grouped upon the flanks the ample farm buildings and tidy yards for the stock—a veritable oasis of rest and thrift and comfort where a man might forget time and trouble in the joy of his surroundings. The other picture doesn't need describing for most of us can see glimpses of it at home. It is all wrong, neighbors, to keep so busy always that we neglect the home surroundings and let the hogs and cattle rob us of a beautiful and comfortable place to live in. It is a fact, too, that we grow to be like our surroundings to quite an extent, and it really does not pay to live literally with hogs unless possibly it might be for a short time to prevent too long and too close companionship with too large a mortgage. You will not only enjoy life better and in a better way by living in a beautiful home but your children will be better satisfied with the life on the farm,—willing to return to it from their school life and you will have the satisfaction of seeing more of them planning a life like yours where the best of town and country meet. It is the ideal life, or can be made so, and it is good to have an ideal in life even though we miss the full realization as far as the young lady you have all heard of did. You remember how that when Jim asked her to marry she answered him that her ideal called for a man with $10,000 at least, and how that when Jim came back again after ten year's wrestle with the world and reported for her approval that he had saved most $19.00, this girl with an ideal and the golden hair said, "Dear Jim, you've done nobly and that's near enough." They found, as we all may, that the humdrum of daily toil may be made a labor of love just as this once wilderness of prairie is fast being turned into gardens of Eden.

Attention to detail will bring better results in all lines of farm work, and better results will add more enthusiasm; and enough enthusiasm makes all work a labor of love and brings about the true joy of living, the ideal for which we strive. Neighbor, let us, you and I, go home and shut the hogs out of the door yard, nail the loose boards on to the barn and sheds, get a barrel of paint and brighten things up, haul the rubbish and scrap iron out of the front yard and have a general, detailed fixing up around the place where we live, so that when we go to town we will want to hurry home before sundown just to get a daylight view of the handsomest place on our road. It is time for us to get in line with the new deal being ushered in with one hundred dollar land.

With rural free delivery the farmer has become part of the great arterial system of the world and the thoughts from the very confines of the earth course through his mind every day. The telephone posts him promptly over a very extensive "neighborhood" and extends his business proportionately. The township road system is building better roads and the King road drag is keeping them smoother, enabling the farmer to add town entertainments to county joys, and the near by rural trolley lines will soon bring the city to our doors. Farmer's organizaions and the detail of more thorough government supervision is promising a more even distribution of the good the things of life. About all we have need to do is to get ready for their reception. The shadows of these coming events are being cast across our thresholds—the substance is knocking at our gates. Rate legislation is about to open the highways of commerce to all alike and tariff ajustment by reciprocity treaties is about to open the world's markets on a more equitable basis and put a handle on the farmer's side of the jug.

BEAUTIFYING THE HOME GROUNDS

THE PAINFUL CONTRAST BETWEEN DOING THE THING RIGHT AND DOING IT WRONG, ILLUSTRATED AND EXPLAINED, BY M. J. WRAGG, WAUKEE, IOWA.

Landscape Gardening, as an art, may not be studied by the planter on the ordinary grounds in the West, but a few elementary principles can be applied without much time and study, and these may result in completely changing the appearance of the place. The ideal landscape consists of open spaces and pretty vistas through a fitting frame-work of trees, shrubs and flowers. Some where about the ground usually the center should be a broad unbroken sweep of grass. The outskirts should be planted in beds and masses, with large bays and projections where, later on, new shrubs and plants may be added at the owner's pleasure.

Every well-laid-out lawn should have an abundance of shade and ornamental trees. There should be planted as a background by the sides of the house, with the conifers and ornamental trees in front of the shade-tree groups. One of the fundamental rules in landscaping is that no trees should be planted in front of the house to obstruct the view except shade trees on the outside of the walk in a village or city and on the margin of a spacious country lawn.

The front yard should have its well-kept grass and flower-beds, its shrubs in groups planted in the corners and angles of the house and walks. The borders should be set with plants of good, low habit, which retain their foliage to the root. It is always possible, in grouping and massing hardy stock, to preserve good views and screen objectionable ones.

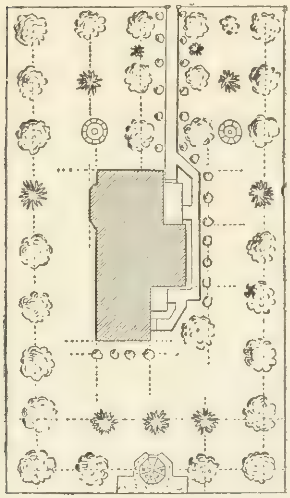


Fig. 1. Poorly planned grounds, with the trees and walks in straight line.

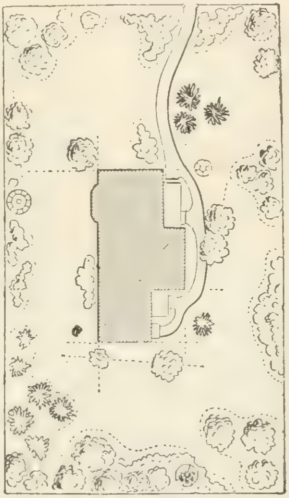


Fig. 2. Properly laid-out grounds, with the walks in curves and the planting done to bring out the beauty of the house.

Figure 1 shows the method employed on many of the home grounds throughout the country and villages. There is an abundance of trees and shrubs, but they are planted out in such geometric lines that they add neither grace, beauty nor utility. Always avoid, if possible, the planting in straight lines. Imitate nature and group the trees, shrubs and herbaceous plants. Give your walks and drives graceful curves, and in these curves plant the flower beds and low shrubs.

In selecting trees and shrubs one should study and take note of the varieties and species doing best in his vicinity, and in trees, especially, planting those that are indigenous to that locality. It is always best to consult your nearest experienced horticulturist regarding what you should plant. On the border, where the massing of shrubs is mostly done, one is always safe in planting such varieties as snowball, lilac, spireae, quinces, syringia, hydrangea and scores of other hardy shrubs and plants, as illustrated in figure 2.

It is on the country and suburban grounds, where one is not cramped for room, where we ought to find the very best examples in the proper laying out and planting of the home grounds. How often we find these grounds poorly arranged with but little attention paid to artistic arrangement in running the drives, walks and the location of yards, barnlots, etc. We call our readers' attention to Figure 3, which is a fair sample of the way that many of our larger rural and surburban homes are planted. You will find that stiffness and precision prevail in the drives and the arranging of the trees. While the general arrangement is good, yet as a whole it presents anything but a pleasing picture, and is not artistic in any sense of the word. There is no excuse for finding grounds planted out in this stiff, geometrical way. Our people should become acquainted with the idea that it is the graceful curve and the grouping of trees and shrubs with large open grass plots that lend beauty to any landscape. We have tried to show in Figure 4 the same grounds with practically the same arrangement as Figure 3, the only change being made in the laying out of the drives and the grouping of the trees, ornamental shrubs, etc. Our readers can easily see at a glance which place is most artistic and it costs no more to have your grounds laid out in this way and it certainly adds greater beauty and increases the value of the estate.

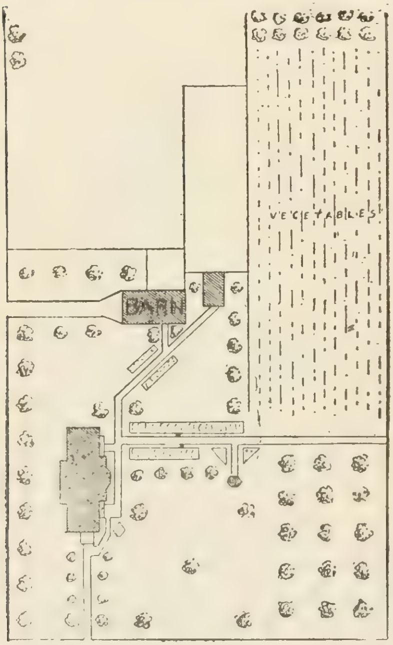


Fig. 3. Stiff, geometrical arrangement of rural and suburban home grounds.

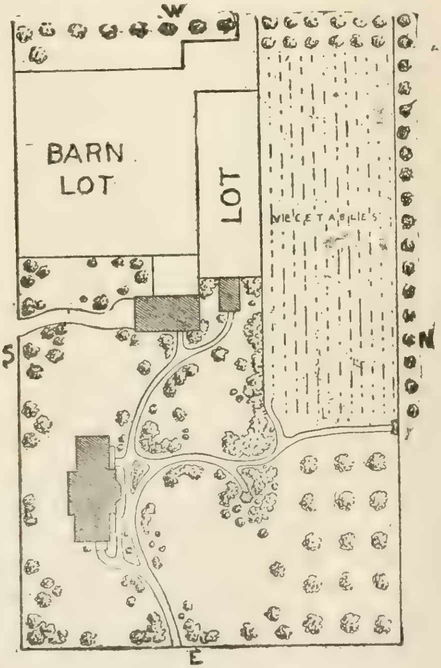


Fig. 4. Same as Fig. 3, but more artistically planned.

On the city lot where space is limited plum and cherry trees may be used to good advantage to form the background for grouping our hardy shrubs and flowers. They are such hardy, round-topped trees that they really add beauty as well as value to the background. In summer they are laden with fruit, and as a rule hold their green leaves late in the fall. Figure 2 gives an idea where these trees can be planted, in the corners near the border of the lot. We believe that each place should have a few fine cherry trees like the Early Richmond, Montmorency and Wragg.

The vegetable garden and small fruits should be back of the house, and sheltered well from the north by the orchard, which in this this country needs no shelter on the north. In general practice the vegetables and small fruits thrive when sheltered from the cold north winds, but from actual experience we have found that the orchards of Illinois, Iowa and the Northwest generally are less subject to blight and sunscald, live longer, and bear more regularly where they are not protected on the north and northwest by dense windbreaks .

It is very necessary in planting the home grounds that the stable, pig pen, cesspools, and other undesirable views should be located northeast of the house, if possible, as the prevailing winds in the heat of summer generally blow from the southwest. It is very desirable that such views be cut off by heavy screens, either by planting of heavy evergreens, hedge, or shrubs as is suggested in the rear of Figure 2.

In planting trees and shrubs in this climate it is very essential to adhere to the following: First, dig large holes, filling with rich soil and tramping the dirt very firmly about the roots. We believe that this is one of the essentials of success. Never water when planting. If a long dry period follows planting rake away some of the top and pour in water until the grounds is well soaked, then replace the surface soil and mulch so as to prevent baking.

But the main thing in beginning the ornamentation of the home grounds is to prepare a plan or map, locating the drives and walks and showing where trees, shrubs and flower beds are to be planted. With a map or plan of this kind one may take his own time in developing the scheme. If you cannot plant all in one year, do what you can, and take up the following year where you left off, and when finished your grounds will be pleasing, not only to you, but to the passersby.

The decoration of the school ground is one of the things that has been very much neglected, not only in our rural districts, but on the grounds of our city schools. Two objects should be kept in view in the decoration of school grounds. First instruction, second beauty and utility. The primary object of the school is instruction. The work of beautifying the school ground should also carry with it the element of instruction. The grounds should serve as an object lesson for residents of the community in which the school is located. They should be laid out on sound principles of landscape architecture and be so well executed as to induce the residents of the vicinity to copy the general idea of the plan and possibly the detail of the grouping and arranging of the shrubs and trees. The idea of beauty can be emphasized in the proper grouping of trees and shrubs in relation to walks and drives. Distance and utility can be subserved by so placing the heavy plantings as to serve as a shield from the wind and sun. If the grounds will permit, the shrubbery can be arranged so as to separate one portion of the grounds from another and not interfere with parge open spaces which would be used as play ground.

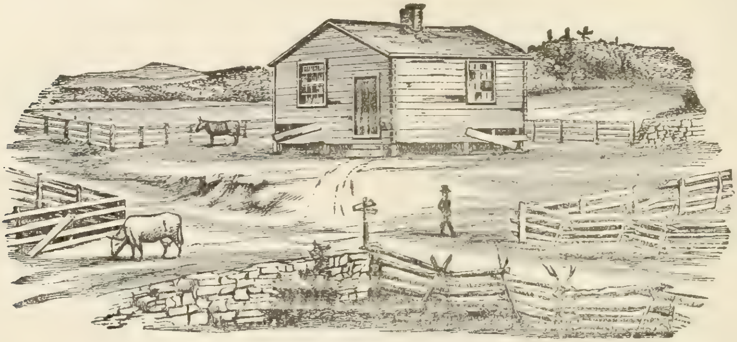


Fig. 5. An unadorned school-house and grounds.

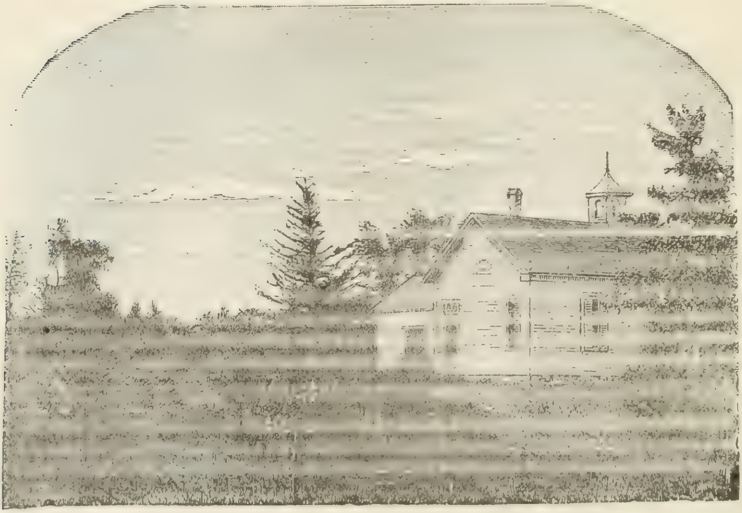


Fig 6. The school grounds with the added beauty and protection of shrubs and shade trees.

We have an illustration in Figure 5 of the unadorned school ground. Many of our readers have seen just such sights in traveling over our state. How can we expect the boys and girls who attend a school with such surroundings and environment to imbibe much inspiration along the line of home making and home adorning. We will call our readers' attention to Figure 6 showing a school house properly located and the plantings so arranged as not only to add beauty to the grounds, but to add protection and shade. While it does not show the drives and walks, yet they may be located as necessity demands,and in arranging them the same rules, as apply to home grounds, must be adhered to. Avoid as far as possible planting in a straight line and the same applies not only to tree planting but to walks and drives as well.

A SMALL FRUIT GARDEN.

PROF. E. E. LITTLE, before Boone County Farmers' Institute.

On every farm in Iowa there should be a small fruit garden. At one time it was thought that in some parts of the state fruit would not succeed owing to the severity of the climate and the strong winds of a prairie sate. It has become an established fact that where the fruits are selected and given proper attention they will succeed in any part of the state, and bear good crops.

An approximate value of the farm fruit garden in the state is twenty millions of dollars. This shows that a large majority of the farmers doubtless are already growing some fruit. Every farmer is well aware that fresh fruit is essential in the diet of every individual, and it can be supplied better from a small garden in a fresh condition than from any other source.

Every year there are many thousands of dollars invested in plants, and it is a well known fact, that a large part of the fruit planted does not succeed. This is probably due to several reasons; lack of judgment of varieties selected, the age, size and where purchased. In buying plants it is very important to make a careful selection. Any farmer who wishes to buy a good animal takes great pains in the selection of a particular kind, having certain essential points. In the buying of plants one should have in mind as far as possible the variety, the age, size, and then ask your nurserymen to furnish these plants if possible. Varieties that have succeeded in your neighborhood should be planted.

During the past year there has been in parts of the state agents selling varieties of apples which are tender and not adapted to the conditions here. Most of the varieties offered were of eastern origin and only succeed in the east and are of no value in Iowa. This suggests the idea "Should a person in this state buy nursery stock from eastern nurserymen?" There are likely to be many varieties that will not succeed and be worthless.

To be sure you are getting varieties adapted to Iowa conditions, buy your stock from some local nurseryman and not from those outside the state. In this state, within twenty-five miles of any locality, will be a good nursery where nursery stock can be purchased. There are nearly one hundred and fifteen nurseries in Iowa. If the stock is bought near home the cost of transportation is much lessened, and it will reach its destination in a day or two, thus avoiding the damage from being on the road a week or more. As soon as it is received, do not expose the roots to the sun or air, but unpack and cover the roots in moist soil until ready to plant.

As soon as the ground has been thoroughly plowed, pulverized and put in good condition, the plants can be planted. The holes in which the plants are to be set may be dug the same day. The plants are taken to their respective holes and covered with soil until planted. If the roots have been mutilated or broken remove them to a piont just above the broken part, then set the plant in the hole two to four inches deeper than it stood in the nursery, filling in with very fine soil and carefully working about the small roots; fill the hole partly full of soil and tramp firmly then fill to top and tramp again; before leaving the plant pull loose earth over the top of the hole. Take a sharp knife or pruning shears and remove one-third of the side branches and leader. Leave a well balanced head with a leader or main stem some longer than the laterals. After the plants begin to bear fruit, arrange to get a spraying apparatus and spray each year.

Spraying is not difficult when good apparatus is at hand. A good spray barrel which can be bought for fifteen dollars would be very serviceable not only in spraying fruits, but poultry houses and animals, so that it could be of practical use in several ways.

VARIETIES OF FRUIT FOR GROWING IN THIS STATE. FOR AN AREA OF TWO ACRES.

Apple.

Varieties of apples for southern and as far north as the central part of the state.

35 trees 24x24 feet apart.

Summer—Yellow Transparent 1, Duchess of Oldenburg 3, Whitney No. 20, 1, Benoni 2.

Fall and early winter: Fameuse (snow apple) 3, Grimes Golden 3, Jonathan 3 and Wealthy 3.

Winter—Tolman Sweet 1 or Ramsdell Sweet 1, Salome 3, N. W. Greening 3, Gano or Ben Davis 3, Ralls Janet 3, Seevers 1 and Black Annette 1.

Varieties of apples for northern part of the state:

Summer—Yellow Transparent 3, Duchess of Oldenburg 5, Charlamoff 3.

Fall and early winter—Wealthy 5, Anisism 3, Longfield 3, Patten Greening 3.

Winter: Plumb Cider 3, Northwestern Greening 3, Malinda 3.

Cherry.

25 trees 16x16 feet apart.

Early Richmond 10, Montmorency 10, English Marellor 2, Wragg 3.

Plum.

15 trees 15x15 feet apart.

Forest Garden 3, Stoddard 3, Wyant 3, Miner 3, Lombard 3.

Pear.

5 trees 16 x 16 feet.

Longworth 2, Warner 2, Sheldon 1.

Peaches.

5 trees 15x15 feet.

Alexander 2, Bokara No. 3 2, Elberta 1.

Grapes.

50 to 100 plants.

Moores Early 25, Concord 25, Worden 25, Niagara 15, Brighton 10.

SMALL FRUITS.

Raspberries.

100 bushes.

Black Gregg 50, Marlboro 25, Red Cuthbert 25.

Blackberries.

50 bushes.

25 Snyder, 25 Ancient Briton.

Currants.

50 bushes.

Victoria 20, Versailles 20, White Grape 10.

Gooseberries.

50 bushes.

Champion 25, Houghton or Downing 25.

Strawberries.

400 plants.

Bederwood 100, Warfield 100, Senator Dunlap 200.

North of the central part of the state on prairie soil off of the timber land, pears and peaches may not be planted to any extent.

Of the bush fruits the raspberries and blackberries need winter protection in the northern part of the state.

AGRICULTURAL POSSIBILITIES OF OUR COUNTRY.

THOS. PARSONS, before Calhoun County Farmers' Institute.

In writing upon this topic, I shall take the meaning of agriculture in its broadest sense. Its different departments might be specialized, but the fullest development of agriculture can only be attained in this locality by diversified farming, so we have every branch of the industry to choose from.

Possibility is that which is not impossible or absurd, although all along the line of the world's history, what has been impossible in the minds of the many has been possible and has been brought about by the thinkers and workers of their generation.

Farmers as a class are apt to look only on what appears to them to be the practical side of the affairs of life and not to live in air castles or set up ideals in their minds to strive to attain. Yet, all the advancement that has been made was conceived in the mind long before its realization.

As long as the early farmer was satisfied with his wooden plow there was no hope for improvement, but when the possibiltiy of something better dawned upon his mind an improved inplement soon took its place.

The thought in the mind of the possibility of something better than the flail for threshing grain brought about the cylinder driven by some power other than himself to accomplish the same work. Then the possibility of separating the grain and chaff from the straw by machinery, the separator was brought into existence. Then the possibility of cleaning the grain from the chaff, and the fanning mill was made. So we might follow through all its improvements until we have the present steam outfit which it seems is beyond the possibility of improvement. Yet some day some mind will see an hitherto unthought of method to do this work and from this vision will develop a way which we now consider impossible.

As long as we thought it was not possible to do otherwise we cut our grain with a sickle and bound it by hand, but when it became evident that it was possible to do this work by machinery we soon had first, the reaper, next the self rake, then the harvester and last the self-binder, all of which have been invented because some man thought it was possible to do so.

Some of you can remember the time when you thought you could only plow one side of a row of corn at a time. Now cultivators plowing two rows at a time are upon the market.

Many, especially among the younger generation, think there are now no possibilities before us. That we have reached the limit it is possible for us to attain along agricultural lines and that our occupation is simply a matter of routine. If we are among this number there is no hope for our advancement. It will be for those that believe there are great things in store for us and that all things are possible who will bring about those things some of us are looking for. In other occupations wonderful possibilities have been brought about. Men communicate through the air; thought travels around the world on cabel and wire; substances without life will repeat every sound that is communicated to them. Electricity will give man light, propell his conveyances and drive his machinery. Machines have been invented that seem to have more than human inteligence and perform their work with greater accuracy than the human hand and mind. If all this has been done in other lines of occupation, is it unreasonable to believe there are great possibilties before us in the growth of animal and plant life

If we have failed to reach our highest standard it is largely because of our new and undeveloped lands. We have believed there was more wealth in acquiring and developing these, than in staying in the older parts and bringing agriculture to its highest perfection. With the passing of these, we must look more to our home lands for our prosperity.

If you will but glance over our agricultural statistical reports and notice the low average of our principal productions you will be fully convinced that we are only on the border land of our agricultural possibilities.

Corn, which is the king of our crops, last year anly averaged twenty-eight bushels to the acre for the entire United States, and thirty-four bushels for the state of Iowa. This looks low when we consider that two small ears to the hill will make over forty bushels to the acres; and a good ear on every stalk, in a field having a good stand, will make over one hundred. In our best fields we can often select an acre that will yield one hundred bushels. If we can raise this amount on one acre we can raise the same on every other, providing we put the land in the same condition and use the same methods in its production. I believe it is possible by cultivation, by increasing the fertility of the soil, by the use of clover, by rotation of crops, by drainage, to make every acre of corn planted in our county yield one hundred bushels to the acre.

Professor Holden and others are constantly telling us how to reach this result, but they can only advise and instruct; we must apply their ideas and do the thinking and the work.

While we hear much about the improvement of corn, we hear little about the improvement of small grain, and yet, I know no branch of agriculture which has greater possibilities.

The average yield of oats for the state last year was thirty-four bushels to the acre; twenty-eight bushels for the United States, and for the last ten years thirty-two bushels. We cannot make our land pay with this return, and we should not be satisfied when we can do better. I believe it is possible for us to raise from sixty to one hundred bushels to the acre, and this may not be its limit. The greatest loss and drawback to this crop is caused by the sowing of seed of poor development and low vitality. Save your seed with the same care as you do with corn. See that it does not rot in the shock, mould in the granary or burn in the stack. If you cannot save the entire crop be sure that you save enough for seed that is as clean and bright as it hangs upon the straw when freshly ripened. But this is not enogh, as the best contains much that is poorly developed. We should sow only the most perfect of the entire crop. To simply clean the seed in the usual way will not furnish the kind that we desire. We must screen and rescreen and if necessary go over the entire crop until we are satisfied that we have only the best developed of the previous year's crop. I have seen the yield of oats increased forty per cent by this method. The crop will require other care incident to good farming but I believe these suggestions if followed will lead us a step neater the realization of its possibilities.

The average yield of spring wheat for Iowa last year was thirteen bushels to the acre and fourteen bushels for the United States. I believe that this yield for Iowa may be greatly increased and it is among the possibilities that Calhoun county may yet become one of the leading spring wheat sections of the state. There may be much incredulity in regard to raising winter wheat in our country, yet judging from what is being done in other localities with the same climate and soil it is possible that we may yet become a winter wheat producing county. Of this crop Iowa raised last year twenty bushels to the acre. Only two states, excepting the Pacific coast states, yielded more. At this high average we raised last year 61,000 bushels. If we can excel other states in raising this much is it unreasonable to think we could raise much more. It may be necessary to radically change our methods in the production of this crop. We may have to prepare our soil in a different way and time; drill the seed to a greater depth and sow some protecting crop. If we could make it possible to raise this crop it would increase the value of our lands and bring us great wealth.

I have mentioned only a few of the principal crops which we are engaged in raising but there are many others which it is possible for us to raise and for which our county is eminently adapted to produce and which will add greatly to our wealth and prosperity.

Our pastures are often considered the least productive of our lands and yet it may be possible to make them return more than any other lands of like area. We all know that they can be improved and that we suffer much from mismanagement along this line. Who would think of working a horse until he had scarcely vitality to maintain life, yet we often treat our pastures in this way, feeding them so close that they are bare of covering through the winter. Keep stock off in the spring until the plant is well started. Take them off in the fall and leave some protection for the winter. See that all parts of the pasture are covered with grass and that this grass is adapted to its particular soil and location, that its poorer parts are fertilized and that its wet parts are thoroughly drained. Then we will more nearly come up to our possibilities in the production of grass.

Dairying has become a leading industry even in our own county. No other part of agriculture has a greater future. We generally consider that we are paid for labor and money invested in the business. Yet if we will investigate most of us will find we are standing a loss which would make any ordinary business unprofitable. Year after year we are keeping cows which hardly produce enough to pay for their keep, being a heavy tax upon the more profitable.

From experiments in one of our states it was shown that while the profit from one cow was $64.32 in one hundred and fifty days, the profit from another consuming nearly the same amount of feed was only $28.06; giving a net profit from the best of $37.65 and only $4.55 from the poorest. Did it ever occur to you it is possible to weed out the poorest ones and bring up the herd to the standard of the best? If we would here resolve to strive to attain to our possibilities and go home and test our cows, get rid of the poor ones and bring up the herd to the standard of the best, this institute would bring more wealth into the county in a short time then is now derived from the busienss in several years.

We are feeding many cattle and should feed many more. It is a business of which we are justly proud. But, have we brought it up to its possibilities? Are we not shipping many poorly bred and half fattened cattle to eastern markets, there to be fed on higher priced land and products, much of the products being shipped from our own state? If this class of cattle can be fed there at a profit what a vast store of wealth there must be for us if we would bring the business up to its possibilities. If we would breed only the best and feed and handle them in the best manner what a source of fertility and wealth it would be to our county. But this is not one of the possibilities with some of us, as many feeders in our county have demonstrated what can be done along this line.

It is one of our possibilities to be able to raise all the fruit that we require in our own county. It is generally conceded that we can raise small fruit, but do we do it? How many of us have a well kept bed ot strawberries, some rows of currants, blackberries, raspberries, and of the many kinds of small fruit which might be mentioned.

It is possible to raise all of this class of fruit which we require, on a very small amount of land and with a very little expenditure of labor and money.

We have passed the experiment stage in the production of summer and fall apples, but we are often confronted with the question "Is it possible to raise winter apples in our climate and soil?" Judging from trees which are bearing winter apples in our own county I think we can safely say this can be done. But it is not possible to do this by following the methods which many of us practice. We must stop allowing tree agents to select our varieties, and to ship them in any way and condition they may choose. I believe that by proper selection and by following the methods of our farefathers, it is possible to raise all the winter apples we can consume, besides raising many for the markets of the world. Plant the varieties that have proven their merit. Go to the nearest nursery which raises the proper kind and have them dug and replanted under your own supervision with the least drain upon their vitality by carlessness and exposure that is possible. After they are planted give them the care you would your growing corn. Watch over them and care for them as though you had faith they would return to you their fruit.

It might be well to graft the wood of the fruit you desire to raise upon some hardy stem that has stood the test of heat and cold, drouth and flood. Do your part and have faith in the result. I believe it is possible for us all to have this fruit in store.

We, today, as in the past, are raising groves of soft and worthless woods. We are not living up to our possibilities in the production of hardy timber. These trees, beautiful as they are, are a monument to our folly. It is possible to do better. With proper care and selection it is possible to raise groves of hardy timber. In our county the elm will thrive and spread out its protecting shade; the walnut will root in our soil, grow valuable timber and produce its fruit; the cedar and the pine will grow and thrive and make windbreaks also valuable and beautiful timber. I am almost convinced by observation that it is possible to grow pine and cedar trees in our county that will make posts and lumber and be of commercial value.

We hear much about the isolation of the farmer and his family. Rural mail delivery and the telephone has done much to improve the situation. There is much that we can yet do to vastly improve the farmers social condition. It is possible to do this in one way by having a general meeting place through the summer months beautified by every means which nature and art could afford.

Why not ask your legislature to provide for a small township park tax, to be expended by men of your own township without compensation for the purchase of a park cite and for its planting and maintenance, to be improved and made beautiful as means will allow. Would not this be a center of interest for the whole township, for their pleasure their profit and their instruction? It is possible to do this of yourselves, and without it being a financial burden. To have a place under your own control to be conducted for your own pleasure and not for the profit of those interested only in the expenditure of your money. This plan is possible and the time will soon come when the farmer and his family will have pleasure resorts as they do now in all the great center of population.

I believe it is possible to make farm life easier; to lighten the burdens, to get a greater return for capital invested and labor expended. We are farming too much land; supporting too many unprofitable acres; paying too much interest on borrowed capital and paying too many taxes on land which gives no return. It is possible to improve our condition by farming less land and by draining that and putting it in the best condition; by doing our work in a better manner; by parting with acres which are not profitable and thereby paying less interest, less taxes, and less for labor which does not make a profitable return. A small farm highly cultivated and well managed will often bring prosperity when a large farm will barely pay expenses or be run at a loss.

As we advance in civilization we learn this truth. The Indian required a township or more to support him; the early settler believed that he must have an almost unlimited amount of land surrounding him for grass and pasture for the sustenance of himself and family. We have progressed so far that most of us think we can make a living on from a quarter to a section of land. This is far too much and when we have learned the possibilities which are before us in less land and smaller farms our prosperity and happiness as a people will be greatly increased.

Our secretary of agriculture understands that there are possibilities in new fruits, plants and grains and is searching in every quarter of the globe for them. Many he has found that are adapted to our locality thereby enlarging our opportunities and increasing our wealth.

There are great agricultural possibilities before us. When the American farmer fully turns his attention to their development we will see results which will startle the world. Animal life will work in the earth at his bidding to hasten the decomposition of matter and to collect the elements of plant life from her store. He will better understand those plants which collect from sunlight and the atmosphere which they require for their growth. Blight, rust, and decay of his crops will cease at his bidding by discoveries which he has made. The rays of the summer sun will be collected and utilized for the warming of his dwelling and the tempering of the winter storms. The winds and breezes which sweep over his fields will be collected and harnessed to cultivate his lands and do his bidding. He will plant belts of timber which will equalize the rain fall and protect his home and his crops. He will better conserve the moisture for his crops in times of drougth and drain his lands for times of flood so that crop failure will almost be unknown to him. Our possibilities are boundless, limited only by the power of man to grasp them. We need not look to other fields for the exercise of our intelligence. Upon our horizon lies a bow of promise upon which is written "All things are possible to he that believeth."

WHAT IS UP-TO-DATE FARMING?

F. J. WIER, before Humboldt County Farmers' Institute.

The expression "up-to-date" might be construed by different people in many different ways but I shall accept the expression as meaning, the most profitable and excellent system considered from all points of view. Up-to-date farming then would be that system of farming which will bring the farmer the largest possible return on his investment of money and labor. It goes without saying that up to date farming in Iowa is diversified farming.

The up-todate farmer so invests his money and labor that a profit may be made on both, and having invested them he is as careful to reap that profit as is the merchant on each article of merchandise in which he invests, or the banker on each note and mortgagee in which he invests. The up-to-date farmer endeavors to make every acre of land he owns bring him in as large a return as is possible; to make each head of stock he keeps pay a profit on the investment and its feed; to make every piece of machinery he buys pay a profit either in the saving of labor or the better work done.

There was a time when we could buy land for $10 per acre, five per cent interest on that land was 50 cents per acre and when we had made 50 cents per acre and expense of working it the rest was profit. Now we pay $80 per acre and the interest on that is $4.00 per acre and every man who does not make his land pay him an average of $4.00 per acre and taxes and all expense of farming it is losing money. There was a time when we bought land for from five to ten dollars per acre, half farmed the high land and let the low land lie in soughs and ponds, and the rise in land values still made us money. That day has gone by.

There was a time when we bought calves for from four to seven dollars per head in the fall; cows and steers for one to two cents per pound when our pasture and hay land cost us nothing; raised our corn on five to twenty dollar land; got men for twelve to twenty dollars per month and made a profit on feeding and milking. Those days have passed away. A large per cent of the farmers who we call well off have put in from twenty-five to fifty years the best part of their lives in hard labor and careful economy and have not made a penny in legitimate farming beyond the buildings and improvements on their land. Their money has come to them through the rise in land values and outside speculation. The profits from the rise in Iowa land when the investment is considered will soon be a thing of the past, and we have got to fall back on up-to-date farming for our profits in the future. The inteligent man who thinks, knows that every acre of land he owns which is covered with water or swamp is a source of positive loss to him each year. Not only is the money invested in that acre absolutely idle but every cent of taxes he pays on it is thrown away. The only way to stop this positive loss is to drain it. Every acre of wet sloughy land producing nothing but slough hay would produce at least as much again and probably two-thirds more feeding value if drained and seeded to clover or other tame grasses. No, slough grass does not pay interest on the investment and your profit is gone. Drain it. Thousands of acres of land in Humbodlt county are farmed every year which are so wet that after the seed, the work, and wear and tear of machinery is counted, do not begin to pay day's wages for farming it. On those acres you are losing money. Drain it. Every farm thoroughly drained so that an intelligent rotation of crops can be kept up including pasture and hay, largely of clover, will increase in productiveness at least one third by reason of this rotation, and this is clear profit. Up-to-date farming means the thorough cleaning of seed grains, especially oats, blowing and screening out twenty-five bushels of every one hundred if necessary and feeding them to the calves. You thus sow oats of uniform size, weight and germinating power. This is as essential in oats as in corn, and does away with so many short weak straws with only vitality enough to produce five or six light and worthless hulls. It means the planting of such carefully cared for and uniform sized seed corn with such an up-to-date planter on such carefully prepared ground that a uniform stand of about three stalks to the hill may be secured, and it can be done. It is surprising how much a too heavy planting will reduce the yield on ordinary land, tc say nothing of the increased labor of husking; and we all know what the result of too light a stand is.

It means breeding of thoroughly good stock of all kinds; avoiding scrub or grade sires always. Occasionally a grade male will prove an excellent breeder but there are so many more chances against him than the thoroughbred that the difference in price is a foolish attempt at economy; but it does not always follow that a thoroughbred is good stock. The country is full of scrub thoroughbreds and the fact that an animal is registered does not always guarantee a good line of breeding or a good individual.

It means the preparation and maintenance of so much good hog pasture, divided into several lots, that all of your hogs especially the breeding sows and young pigs shall have all of the blue grass, clover and rape pasture that they can make use of during the summer months together with all the milk you can give the pigs and they will need but little corn. The man whose hog lot is hog wallows and bare ground and who grows and fats his pigs on corn alone may think he is selling his corn at a good price, but if he weighs the corn he feeds for one season he will be surprised at how little he gets for his labor.

It means the feeding of a good grade of cattle only, and careful and intelligent feeding. It means such a change and variety of feed as will keep their stomachs in shape to digest and assimulate the greatest possible quantity of fat producing food and feeding until they are well finished. One of the great sources of loss in cattle feeding is shipping in half fed cattle. The wide range of prices between fat and half fat cattle should teach us that the most profitable corn we feed is the last corn we feed. We all know that no man can make a pound of beef in the feed yard for what he gets for it in Chicago. His profit is the difference in the price per pound which he pays for the carcass and for which he sells it. The wider he makes this difference, as a rule the greater his profits. It is constant care that no pig, calf, colt, or other young stock shall have its stomach contracted and its growth stopped and stunted from the time it is born or bought until it is matured or sold by either hunger, thirst or long exposure to cold. Every time the growth and thrift of a young animal stops either on account of no feed or the wrong kind of feed, we do not only lose all our feed and care during its stand still period and defer its maturity many times its stand still period, but its weight at maturity will be short at least what it should have gained in that period and usually much more.

It means good farm buildings. I do not mean by this great big and expensive houses with more room than it is possible to use, and barns that stand partly idle the year around. There is such a thing as having a lot of idle capital wasted in too large and expensive farm buildings. We want well built, well planned, well painted buildings corresponding in size to the size of the farm and the class of farming which is being done.

It means good fences and good clean fence rows sown to grass and scattering grass seed each year instead of weed seed.

It means hog tight woven wire fences around our farms or a large portion of them, so that our young hogs may glean our stubble and corn fields and get the benefit of the fall pasture as well as the cattle.

It means sowing clover in all small grain. The fall pasture will more than pay for the seed and if you plow it up the next crop wil pay for it again.

It means a medium sized herd of dairy cows, each one of which you know by experience gives good milk, plenty of it, and milks easy. Don't touch the Jersey for the calf must make a feeder. A part of your team force should be good draft mares and bred to the best draft horse you can find. Keep shy of the light road horse. You can sell one draft horse and buy two or three drivers with the money.

You should have a small apple orchard and plenty of small fruit and should buy your nursery stock of an Iowa nurseryman on whose honesty you can depend. Don't buy nursery stock of jobbers.

You should have a wife who takes an interest and delight in handling poultry and who will either coax or force you to build commodious and comfortable poultry houses. Most farmers have such wives already but those who have not should secure one at the first opportunity. I have been watching my sister-in-law's poultry business for the last four years and I know of nothing on the farm which brings in as large returns on the investment in dollars and cents to say nothing of the luxury of unlimited fresh eggs and fried chicken. On a farm a large per cent of the hens' living would be wasted without them.

An important factor is up-to-date farming is the hauling and spreading of our stable and barn yard manure as soon as possible. A very large per cent of the fertilizing elements in stable and barn yard manure is either burned out or washed out before it is spread upon the land. Another mistake made in spreading manure is putting all we have on a very limited area and permitting the larger portion of the land to go with none. Much more value can be realized from a given quantity of manure by thin spreading over a larger area.

I have endeavored in this paper to mention a few of the many faults, wastes and losses in our present system of farming. I have tried to suggest a few of the many most important factors in building up and developing an up-to-date Iowa farm, and a system of up-to-date and diversified farming which shall produce the greatest possible wealth on a given number of acres, but the facts are that the farmer will never approach the greatest and best possibilities in agriculture until he studies and applies to his business as far as possible the economy and business principles practiced in other lines of business. Take the great packing industries for which we furnish the raw materials. Not a bone or a hoof, not a horn or a hair of all the millions of animals they slaughter goes to waste. Not a pound of meat though it comes from a part of the carcass that we would throw away, but is put in shape to sell at fancy prices. When a cow gets so poor and old that she cannot chew or digest her food, and our local butchers will not slaughter her, they buy her for a song and send her back to us in cans and we pay as much per pound for her as they do for their fine roasts and steaks. There is nothing too small to save with them. The tradesman is as careful to sell you a spool of thread or a nickle's worth of gum as he is a bigger bill. He collects the twenty-five cent account as carefully as the twenty-five dollar one. The secret of success in business is looking after the small leaks and small profits. This is one of the respects in which the average farmer is not up-to-date. I have, so far, discussed up-to-date farming in its relation only to the production of wealth. I should consider it a misfortune if my instruction should result in making us all millionaires, for in that case we would probably all get to running for congress or looking for a state or federal snap, or forming an agricultural trust and might neglect our farms and families. But, seriously, there are other lines beside the producing of wealth in which the farmers must be up-to-date in order that the wealth he produces may be a blessing and not a curse. He must, as a class, be morally, mentally and intellectually up-to-date. In fact any great advance in the financial and commercial condition of the farmer as a class must be coincident with a great intellectual advance and this intellectual advance is now in progress. The up-to-date farming communities have their rural phones and rural free delivery.

The rural free delivery is one of the greatest factors in brightening up the rural mind that the farmer ever had. The up-to-date farmer realizes, as never before, the necessity for placing before his children every possible opportunity and incentive to acquire a thorough and practical education. One of the most substantial and storm-defying foundations for a useful and lovable human character and life may under present conditions be laid in the Iowa farm home. Good books, the entertaining features of which do not detract from their great value as character and ideal farmers for children are abundant, and properly selected, are the best investment ever made by a parent for his children. From these they form the splendid habits of good reading, and thinking. One or two of the thoroughly good farm papers printed in Iowa should go to every farm home in Iowa once a week. Their cost is insignificant compared with their great value to the farmer and his boys who have formed the reading habit. Call their attention to good articles in the papers. Compare suggestions in them to your own methods. The boys will grow interested in these comparisons, no matter how young, and are soon interested in the best methods of farming. Their comments on politics and politicians are fair, unbiased, and pure political reading. It is good for boys. At least one among the best of our state dailies should reach every farm that has rural free delivery. The current events, the trend of popular thought, the doings of public men, the throbbing life of the county, state, nation and the world as it comes to you each day through the paper tends to brighten the mind, to broaden the mental horizon, and makes one a more potent and useful part of the great republic, which today sadly needs the corrective political influence of an intelligent, independent, thinking common people. A great number of magazines of only nominal price furnish entertaining and valuable reading for young people. These magazines are usually non-partisan and their discussion of important moral and political questions are generally free from political bias and contain a fair statement of the facts. Encourage the young folks in the study of political economy, of practical politics, of the great moral and public problems. Upon the moral intelligence and mental activity of the rising generation, among the middle class, depends the future wellfare of the farmer, and of our nation. Unless we are up-to-date politically and are capable of defending and securing our political rights, it matters but little how much wealth we produce, for it will be appropriated by our American aristocracy of corporate wealth who already have much more than their share of commercial and political power and in their hands will do common humanity but little good.

Up-to-date farming means the intelligent application of the best methods for bringing every acre of land up to its maximum limit of productiveness, as we learn those methods through our own experience, our agriculaural press and agricultural colleges and experiment stations. It means the application of these methods for the greatest production of the most profitable products of Iowa agriculture. It means keeping in touch with the great public questions and public men of the day and intelligent study of both questions and men as they relate to the great agricultural interests of Iowa. It means going to the polls every primary, caucus and election day and voting for those men for legislative and executive offices who dare to come out manfully and fearlessly and advocate those measures and policies which shall give to the farmer and all common people their just share of our nations commercial and political power and thereby insure to us a more just division of the vast wealth which we every year produce as farmers. Do you say that this is up-to-date politics and not up-to-date farming? I answer that we must be up-to-date thinkers and voters to reap any benefit from the wealth we produce as up-to-date farmers. In short, if we reap any benefit from intelligent and up-to-date farming we must be intelligent and up-to-date along other lines of business with which we are interdependent for business existence, and surely the laws which govern the relations and fix the fees between the farmer and the railroads, the insurance to their share of the world's wealth for doing their share of the world's companies, the lawyers, bankers and doctors, are of vital importance, since in an agricultural state like Iowa they all make their living and money off the farmer or the products of the farm. They are all entitled work, but let us farmers get into position to have something to say about the divisions.

HISTORY OF IOWA FARMERS' CO-OPERATIVE ASSOCIATIONS.

REGISTER AND LEADER, 1905.

One of the most remarkable growths in Iowa business affairs during the past year has been the increase in the number of the Iowa farmers' co-operative associations. The coming annual meeting, scheduled for Mason City, Feb. 1 and 2, of this organization of Iowa farmers, calls to mind some facts which the chronicles of the organization show. Accordto the report of the secretary at the last annual meeting there were exactly thirty societies in active operation in Iowa. Since that time there has been seventy-five new ones organized and between thirty and thirty-five more in process of organization. Millions of dollars that have been subscribed by the tillers of the soil by mutual agreement is invested in the properties and business capital of these institutions.

What, but a few years ago, was the sneer and derision of the so-called orthodox grain men of the state is now a giant to which all dealers in the products of Iowa soil are willing to bow. The history of this organization movement is unique. There is no other business organization quite like it anywhere. It aims at no dividends, only in the prices it pays for grain, the largest seller, of course, getting the greatest returns. Its slogan it, "A fair deal, stick together, pay your commissions, and when selling elsewhere look our for the weights." There is no assessmens of stockholders and in no case recorded in Iowa has any society experienced a deficit. The directors may borrow money with which to operate the business, but not above two-thirds of the paid in capital stock. Above that amount, if money is obtained, it is secured through the individual guarantee of the director and is in no sense an obligation to the society. Coal, flour and feed are sold to members at a slight margin and to others at an increased margin. It is estimated that men who deal with co-operative companies save from 10 to 25 per cent in every purchase.

All farmers' co-operative associations of the state are founded upon the theory that the farmer is inslaved to grain buyers and that this method is his only emancipation. The fight for supremacy and for the lives of the societies in the different sections where they are located is kept ever fresh in the minds of the members each year. It is rehearsed as often as the association renews its vows. Each year the question is asked whether there is a desire to go back to the old method of selling the product of the farms, but the answer always comes, "Go ahead, stick together, and we will win."

PENALTY IS PROVIDED.

To keep the unfaithful in line a penalty is provided. If a member of the association sells his grain to an old-line elevator he is taxed ¼ cent commission. In a few instances over the state examples have been made of those who are catering to the "enemy" that have been salutary, and such offenses, if persisted in, usually mean banishment from the councils of the association and almost social ostracism. The culprit has often found it convenient to remove to some other locality.

Be it said, to the good fortune of the co-operative organizations of Iowa, that they are well managed, and there has not yet been developed a single breach of business unfaithfulness on the part of any of its local managers and officers. In all cases, so far as can be learned, the management has been both shrewd and honest and has instantly refused to listen to any and all overtures from other concerns. Offers have been made by line companies to enter into an agreement with the association to fix the prices at local points, but the temptation has in every case been spurned, the officers believing they detected some attempt to inveigle them into forfeiting their character by unlawful combinations.

This danger—mismanagement—was the rock the enemies and some of the friends, even, of the co-operative methods was sure the movement would strike before it went far, but, happily, these have been avoided.

Men have been content, even poor men, to manage the local business, to receive the $800, $1,000 or $1,200 per year and a clear conscience rather than feather their nest and retire rich and despised. All of them seem to consider their positions in the nature of a public trust, and have acted accordingly. The individual society has no secrets. The books are open to its members or to any other person who cares to look into them. Even the meetings of the directors are open to any and all visitors. This stills any suspicious whisper that might be born of secret session or unpublished methods.

The report of the state secretary, C. G. Meserole of Gowrie, which he will make at the coming convention at Mason City, will show Rockwell and Gowrie societies the leading societies of the state. Of the two, Rockwell is first in the matter of the number of bushels of grain handled, while Gowrie is first in the number of feet of lumber sold during a stated period. In the shipment of live stock, they rank about equal, with a dozen other societies of the state crowding them closely. All the associations are prosperous, and this, too, in spite of the alleged unfair and unrelentless competition from the line business. It is strange, but nevertheless true, that often a farmers' association, as well as a line elevator, exists in the same town, and both often do a thriving business. It was the public declaration of the manager of the line elevator at Rockwell, where he is confronted by the strongest farmers' organization in the world, that the volume of his business last year was far larger than any year in the history of his elevator experience with his company, and that the business paid well. This is not only so of Rockwell, but has been found to be true of other points where the two business firms stand side by side, although when there is a rumor of a farmers' association being effected the line company begins to complain of cold feet and want to let go. They frequently sell to the society.

Wherever a farmers' elevator has been established it has tended to increase the market price of grain from a half to one and a half cents per bushel. Many line companies seem able to pay this increase and live.

EFFECT ON TOWNS.

The effect upon the towns where these farmer societies have been located is varied. In all cases, so far as can be learned, when the society has restricted their business to simply the handling of grain and coal and perhaps live stock, the effect upon the town has been beneficial. On the other hand where the society has gone to the handling of flour, feed, live stock, clothing, machinery, and other farm and home necessities, the tendency has been to ruin the town and drive its merchants out of business. It has had a tendency to depopulate rather than increase the population and wealth of the place.

The state association is under the most careful supervision of an able corps of officers who give largely of their time to its interests. The management is divided into seven departments—the directorate, the executive, the claims, the legislative, the transportation, the arbitration, and investigation and the grades. In each of these departments, the special function is suggested by its name. They are made up of the leading farmers of the different communities where co-operation thrives. At present the most active men of the association are the secretary, C. G. Meserole, Gowrie; Thomas McManus of Dougherty, the father of the movement in Iowa, and a member of the arbitration and investigation committee, and Edward Dunn of Burchinal, the traveling representative. These men are in close touch with the situation in all parts of the state and their time is largely taken up in what they term missionary work. An excerpt from a letter, hundreds of a similar nature which they receive, is given which shows the demands upon their time:

"Dear Sir: We are in need of a farmrs' elevator in Lake City, is the general opinion of the farmers around town. Since the elevator at Wightman has been running, farmers east of town can get from one to two cents more per bushel than farmers west of the town."

The secretary's report will show that he assisted in the organization of forty societies during the past year. It is the opinion of the apostles of the movement that before another crop moves, there will be 200 of these organizations doing business. It is averred that the thing that will bring this rapid growth about is the tendency on the part of the line companies to rob one community in order to better fight co-operative force at another point. The state association men, who are actively engaged in the work have laid down certain principles which they are endeavoring to follow:

First—To secure for all the farmers in the state a just and fair return for their labor.

Second—to put a stop to the blacklisting, boycotting, persecuting methods of the grain dealers' association and all other trusts masquerading under the cloak of a trade orgaization.

Third—To bring about a closer relationship and better feeling between the legitimate business men and the producers.

Fourth—To make graft and thievery disreputable and bring about conditions in trade that will be possible for the business men and the producer to practice the golden rule in their dealings with one another.

NORTHWEST IOWA LEADS.

Northern Iowa leads in the co-operative movement. Cerro Gordo county is the banner county, having nine organizations in active operation, with one in the course of organization, making a total investment of about $150,000. Another stronghold for co-operative business is in the vicinity of Gowrie. Along the Great Western line for a number of miles each way from this place, each town has a society. The capital stock varies from $2,000 to $15,000 at the outset of the organization. Last year Rockwell transacted $365,000 worth of business and handled about 440,000 bushels of grain. Stanhope in Webster county transacted last year a quarter of a million of dollars of business. Rockford, Floyd county, handled over 300,000 bushels of grain, and Dayton nearly twice as much. Britt in Hancock county handled from Sept. 1, 1905, to

November 1, 1905, the two months of operation, 110,000 bushels of grain. St. Ansgar, which is also a new society, organized within the last few weeks, has a capital stock of $15,000 but this society will handle live stock.

The cost of handling the business is small. Rockwell did $624,000 of business in 1901 at an expense of ¾ of 1 per cent, or at a cost of about $4,000. It cost Gowrie to do $365,000 the same year $2,500. Another society with a $80,000 business did it at an expense of $1,800. It will be seen that the larger the volume of business the less the cost to operate.

These samples given only indicate what the other societies of the state are doing. All are practically doing the same kind of business and at the same rate of cost per the amount of stock invested. No society is allowed to organize with less than $2,000 worth of paid up stock. The officers of the state organization are:

President—N. Densmore, Mason City.

Vice president—Perry Algers, Ruthven.

Vice president—S. Nordschow, Badger.

Secretary—C. G. Meserole, Gowrie.

Treasurer—J. H. Brown, Rockwell.

Directors—B. Hathaway, Pierson; John Montgomery, Goldfield; W. D. Purdy, Fredericksburg; Arthur Chambers, Dumont; J. B. Hart, Postville; Thomas McManus, Dougherty; D. Hodson, Garden City.

Executive committee—B. Hathaway, J. B. Hart, W. D. Purdy.

Claims committee—D. Cahalan, Rockwell; C. G. Meserole, Gowrie.

Legislation committee—A. N. Smith, Gowrie; Thomas McManus, Dougherty; T. L. Knight, Goldfield.

Transportation committee—B. Hathaway, Pierson; F. Campbell, Rockwell; D. McArthur, Mason City.

Arbitration and investigation committee—Thomas McManus, Dougherty; A. N. Smith, Gowrie; C. H. Warbis, Rinard.

Grades committee—F. Campbell, Rockwell; R. Baxter, Galva, Aaron Peterson, Lanyon.

TO WHAT EXTENT, IF ANY, SHOULD AGRICULTURE BE TAUGHT IN THE COUNTRY SCHOOLS?

JOHN DE KOSTER, HULL, IA., BEFORE SIOUX CITY COUNTY FARMERS' INSTITUTE.

Looking through the handbook of Iowa Schools, which is the course of study laid out for the public or rather country schools of Iowa, we find that that course, as it now is, is quite heavy and that there is very little room for additional work. It is an eight year course and very few of our country pupils finish the course. Now the question is: Can we add to the course, or, is there perhaps some branch in the course less important than the subject of agriculture and that therefor we cut that out and put agriculture in its place? Is there something in the course now that is less practical than the subject of agriculture.

It is an undisputed fact that the parents or guardians of more pupils are engaged in farming than in any other occupation. If, therefore, we should teach in the schools what the pupil will have to deal with in life, certainly agriculture should be introduced. It must be admitted that it is vauable to study the subjects that are closely related to the life of the people; if therefore they are urging it for the schools in the cities, how much more valuable must it be for the rural schools and the graded schools in our country towns? Some people have grown altogether too wild over what is called "higher education," but there seems to be a move on foot just now to teach the things that are more practical and less of the theory; more instruction as to how to actually do the work that is to be done.

Many children at school get the idea that the farmers are the only people that need to work; they have the idea that the people in the city are enjoying themselves every moment, and that their labor is more like play. I believe that a study in agriculture would have a tendency to change this idea. It would, to some extent, broaden their mind and change their way of thinking. If he studied the soil and the forces of nature with which he is surrounded, he would see harmony where all was a puzzle to him before. For instance, nearly every one now knows that one of the most essential foods for plants is carbonic acid; and we know too, that animals as well as man breathes out that very element. On the other hand plants throw out, or breathe out, if I may call it that way, the gas called oxygen, which in turn is one of the most essential foods for man and animal. Isn't this a beautiful discovery, and if you were the person who had discovered this, would you not feel as if all boys and girls, men and women, ought to know this? It is true to have flowers in your window look well, but do they not seem more beautiful to you when you know that they are making oxygen for you; that they actually purify your air as well as beautify your home? Would not this knowledge deepen the boys way of thinking?

The farmer should know that humus in the soil helps the growth of plants, that it enables the soil to hold more moisture and prevents the soil from baking; that it absorbs ammonia (which contains oxygen) from the air and thus fertilizing the soil. Then also that barnyard manure is the best supplier of humus to the soil.

It was about two years ago that a friend of mine asked me how to best to enrich the soil of his garden; this patch had been used for garden for several years and is being used for a garden to-day. Not knowing how to best answer the question, I told him I would write to the agricultural college for the information, which I did. They answer that: "There is nothing better than barnyard manure." Since then I have read a few books on agriculture and have learned the reason why.

Right here I might also mention that we ought to feel closely related to our agricultural college. If you have some question which you cannot answer satisfactorily for yourselves or for your friends, do not be afraid to ask the college or some editor of a good agricultural paper or magazine.

A farmer should also know the value of clover, not only as a food, but as a fertilizer. The intelligent farmer knows, but all farmres should know, that clover is a great nitrogen gatherer. A clover plant may be pretty above the surface of the soil, but also below the surface it is full of interest. Examining the roots of a clover plant you will find little knobs of swellings on the larger roots. These swellings are workshops in which the plant manufactures nitric acid in the soil. The nitrogen, taken from the air, is here manufactured by swarms of minute beings into nitrates, which are plant food. Not only do these minute beings manufacture enough for the clover plant, but it enriches the soil with that food which is an element needed by all plants. This does not mean that the clover will enrich the land in all the necessary elements, for it takes from the soil, potash and phosphoric acid, and therefore, growing clover year after year on the same patch, will rob the soil of these elements. Here we see that a rotation of crops becomes necessary and it requires a little study to know what crops should be used in this rotation. Clover is not the only plant that furnishes the soil with nitrates; alfalfa, peas, beans and a few others are also nitrogen gatherers. It will not be a disadvantage to a farmer, or a farmer's boy or girl for that matter, or any one else to know these things. Not only the four-leafed clover, says some one, should be looked upon as bringing good luck but any leaved clover should be regarded as good luck to the farmer.

Other lessons besides keeping the soil in condition, should be learned, especially those of fighting pests. Those who have studied the problem, tell us that since the potato bug eats the leaves of the plant, we can rid ourselves of these by sprinkling the leaves which they eat with a poison. But they tell us that the insect commonly known as the plant louse, does not eat the plant, but sucks the juice out of the plant and that consequently we cannot kill these with a poison. The way to kill these, is to sprinkle the plant with something that will prevent their breathing. Perhaps soap suds, tobacco water or kerosene mixed with water.

Then there are the fungus parasites which need looking after. Smut in wheat is one of them. The rotting of plums and cherries as well as grapes are examples of these fungus parasites. To prevent this fungi the Bordeaux mixture is used to sprinkle the plant with. This seems to be an effective preventive and is easily made. Take a barrel that will hold at least twelve gallons, put in it five gallons of water and in this water hang a sack containing one pound of blue vitriol; in another vessel slack one pound of fresh quicklime also in five gallons of water. When the blue vitriol has been dissolved and the lime slacked, stir the lime water and strain it slowly into the barrel in which the blue vitriol has been dissolved. Now you have the Bordeaux mixture with which you may sprinkle the plant. But to sprinkle your wheat field would be too big a job, therefore you will have to take another course.

To prevent smut in oats and wheat it is necessary to soak the seed in a mixture of one pound of formaldehyde to fifty gallons of water. Soak the seed for twenty minutes and then spread it out so that it may dry without heating. It is claimed that this will prevent smut entirely and many farmers know that a loss of twenty per cent is sometimes suffered through the growth of this smut.

Now, you may know that I did not know how to make these mixtures without finding them on the pages of some book on agriculture. This is the case and I am not ashamed to tell it, for I have never studied the subject of agriculture. But I have read a few good books along this line out of which we have learned a great deal and this brings us to the point in question, how we shall teach agriculture in the public schools, if we shall teach it at all.

If you have no instruction in school, get a good book on the subject. No matter how successful a farmer you are, it may and will be useful to you. You know that a good cook uses a cookbook. She may not find occasion to use it very often but she finds it useful once in a while at least. I would suggest that a farmer use his book on agriculture the same as a cook does the cook book. This suggestion of course, would be out of place for those boys who have had instructions in the line for they certainly would get such a book, although it might not be so necessary for them as for the other man. But the boy that has had the instruction would feel interested enough to have such a book.

From such a book you may learn the value of certain birds, how to prevent smut, how to kill certain injurious worms, how to test your milk, build a silo, treat your butter, take care of your horses, cows and sheep; how and what to feed your hogs, what the value is of a cream separator, and a manure spreader as well as a homely toad in your garden. This book will tell you that each thread of silk that receives a grain of pollen produces a kernel of corn for the ear. The boy who knows this will be careful not to pull this hair (as he calls it) out. When we lived on the farm we were bothered with the currant worm. Every book on agriculture will tell you that to destroy the currant worm, all you need to do, is to sprinkle the leaves with water that has in it powder of white hellebore; one tablespoonful to three gallons of water. Read a good magazine as well as a good book along the line of agriculture, they are inexpensive.

Just a few minutes ago I had intended to come down to the point by telling you what my idea was as to how and to what extent agriculture should be taught in the public schools, but the importance of the subject seems to reign supreme in my mind.

Why do boys leave the farm and go to the cities? I believe it is because the cities advertise and the farms do not. Cities will advertise their parks, their theaters and everything they have both good and bad, but we do not often read of the good things that the farm produces.

Does advertising pay? I will tell you what I think. Last summer I was in North Dakota and Montanna at places where land last year was selling from five to six dollars less per acre than it is now selling for. and this simply because it had been advertised. You have all heard about the beautiful Willamette Valley in Oregon. Wry is it so famous? What makes you long to see that country? What makes me anxious to see it? Simply because the railroad companies who were anxious to take you and me down there, had advertised it. Now, you may ask, is it not a nice country? Why, it certainly is; but now in turn may I ask, is not Iowa a beautiful country? We read of this and that place having fine land, etc. They may picture to us so that we will long to go there, but the farm, just the farm, the luxuries on the farm are not advertised; consequently the boy begins to think that the farm is not as good a place as something else and he leaves it, only to find later that the farm was after all as good a place as the other thing and that he was better adapted for the farm.

If the boy had been interested in the farm and farm life he might not have felt the desire to leave the farm. I am sure Iowa is a good state, even though it be an agricultural state. I also know that I would rather live in northwestern Iowa, or in one of those beautiful western irrigated valleys, than near the Brooklyn Bridge in New York City, or near Lincoln Park in Chicago, for that matter.

I have already taken up too much of your time, but I will now tell you in just a few words how I think agriculture should be taught in the public schools and to what extent.

We are already on the right track. Farmers' institutes are fine training schools for farmers and the farmer boys. The corn contests are inteesting the boys over the county. What can the public school do?

It has been argued that it is impractcial to introduce this branch because the teachers know nothing about the subject themselves. This is no argument. A short time ago, I heard our county superintendent make the remark that "half of our teachers can't read." Would you therefore take reading out of the course of study? Of course you would not.

We wish, however, to be practical. It is true that our teachers are not versed in this subject; it is also true that our teachers are crowding now to get the work all in, but we will take it for granted that most of our teachers can read, a litle at least. We know that most of the reading courses consist of from five to eight readers. The eight book course, as a rule, has no more work in it that the five book course. Besides these readers most of the courses require some supplemenatry reading to be used with the course. This is the right thing to do, for you know that to read the five readers in school if that were to be all the reading you would do in your lifetime it would amount to but very little. Now, I would suggest that one of the readers be an agircultural reader; if not one of the readers, then one of the supplementary readers. Be careful to select an easy book; I mean a book that presents the matter in plain and simple language. "First Principles of Agiculture" by Goff and Mayne is such a book, and there are other good books on the market.

It is not necessary for the teacher to know everything about farming, for the book explains itself. The child will be interested in it for it tells him things he has not thought of before. When Jimmy comes home to his mamma, who is worrying over her flowers which the lice are killing, he will say "Mamma, why don't you sprinkle them with soap suds or tobacco water? We have just had a lesson about that in school today."

Frank, too, comes home just as papa is telling mamma that the worms are eating all the leaves off the currant bushes. Don't you think Franky would tell his papa how to get rid of the pest? I know Franky would tell his papa what they had read about that at school. More than that, Frank would go into the garden every day, especially after the currant bushes had been sprinkled with the hellebore mixture, to see how the currants were coming. Frank would feel that he was a factor in making that currant growing a success. He would feel an interest in the farm; and that boy would probably not leave the farm for the city. I don't believe that the boy would wait until his father told him or his mamma that there were no worms on the currants, but after school when they had had a lesson about the currant worm, you would find Frank in the garden looking for the worms, and he would probably find them before his papa.

Not only should a book on agriculture be one of the books in the regular reading course but the teachers too should be required to read some books along that line. This was actually done last year in the reading circle work and I am sure that many profited by reading the book "The School and Farm" by Chas. A. Eggert.

In addition to this the president and secretary of each school corporation should select for their libraries at least a few good books on agriculture. It might be a good plan to adopt some kind of a merit system, giving the pupil credit for reading these books under the direction and guidance of the teacher. Perhaps a small gift to the boy or girl giving the best book review might be a good stimulant to make them read the books.

I am not in favor of going into the subject very deeply. A few good books, written in simple language, well indexed, so as to serve as a reference book at home later, is in my opinion sufficient. If further education along the line is desired, send the boy to the agricultural college during the winter months, and there get the required training.

I have taken more of your time than I expected to. I know some of you, perhaps many of you are getting tired, and yet I have not said very much. Perhaps I am not one of those fellows that can say much in a few words. But I wish to leave this thuoght with you at least that there is room for improvement on the farm, but that it is more important to improve the farmer. You have all heard the expression "Take care of the pennies and the dollars will take care of themselves." So also, I believe we might say: Improve the farmer and the farm will take care of itself.

I see by the program that we will have one more paper along the same line; also that the papers are to be discussed. I hope that better points than I have brought out will be brought up. We have met here together to learn from one another; to get each other's ideas. If some one does not think as I do, let us hear from you frankly. If some one perhaps would like to see a solid course of agriculture introduced into the public schools, make the fact known and give your reasons. If another should happen to agree with me or the other man as to the amoun of work done, but would like to have it taught differently, let us hear from you. Should there be one here who agrees with us altogether but would like to have the points argued a little more fully, let him do like a member of the jury sometimes does, and take the other side of the question for awhile at least. This is not a theoretical question but a practical one; a question on which action may soon be taken, and on which action is now being taken. It will depend on you and me as well as others how we shall teach agriculture in the public schools as well as how much of it, or whether we shall teach it at all. I therefore invite you all, farmer or not, to join in a family discussion of this very practical and important question.

SHOULD THE COUNTRY BOY GO TO COLLEGE.

J. F. WOJTA, NICOLET COUNTY, MINNESOTA, IN BREEDERS' GAZETTE.

The question is often asked, "Why should the country boy go to college." From the outset the country boy is not differently constituted, physically or mentally, by nature, from his city brother. But the country boy's location on the farm, his occupation and his environment cause in him a development of certain attributes such as will be of great advantage to him. He is taught patience, sympathy, honesty, obedience, and above all, in a large measure, has established in him the fundamentals that go to make up good character.

The boy possessed with these qualities needs to develop them by training so that he may make the best use of himself in life. No college can make a great man or a genius out of a boy who is not possessed with the qualities that would make him great. A college does not create faculties but it directs the development of them. A college represents a personal process and a result which may be termed self-discovery. Many boys go to college with definite ideas to become great lawyers, ministers or farmers, but often the intending lawyer becomes a farmer and the intending farmer becomes a lawyer or a doctor.

In the college the country boy will learn to know himself. He will learn to know his strength, his weaknesses, his ambitions and his purposes. It is well to have a definite aim, for it promotes rapidity of endeavor. A country boy who supplements his practical training with the theoretical knowledge obtained in college will be self-reverent. He will put himself into relationship with other men with history, and with the various complex problems which American life is to solve in the future. A college training will lead the country boy to observe and to think what the farm has taught him to do, thus combining these ideas and making them active and effective. Such training will not only fit him for better service in the community but, wherever may be his field of labor, it will make a better citizen of him. College training largely is a force which added to the natural force of many men has helped to constitute their great growth.

But can the average country boy be spared from the farm until he is 20 or 21 years of age? If he could be spared it would be of some advantage to him. It is impossible to exaggerate the importance of college training to any young man. His happiness and social efficiency in no small degree depends upon the effect that college training has upon him. It is the use of faculties trained to the widest range of enjoyment that makes for the richest experiences in life. It is education that enriches the life of individuals and nations.

Let us look at Germany, which is training the hands as well as the heads of its boys. Its entire school system is progressive and the country is making great headway not only in science and art but in every thing that goes to dominate in human affairs. What is Russia with its large number of men and women who do not enjoy the learning and the training that people of progressive nations do? As nations have ideas and ideals, so they live and lead, and in that way are powerful. There is nothing of greater advantage to any nation than when men are able to direct their energies by the wisest methods for the most possible good.

The country boy should have as far as he can an education that will fit him for his chosen calling, be it that of a doctor, lawyer or farmer. Let it be training in an agricultural college; it will help him to farm and bring out habits of accuracy and stability in his work; it will furnish the foundation for his successful career as a farmer. The country boy has quite a laboratory on the farm, and when his parents are reasonably prosperous he has a fair equipment for experimentation. The work planned for him by his teacher will give him a course in scientific study.

Many a country boy will be led to see the rare possibility for the practical man in agriculture, the trained man. The day is at hand when the successful farmer must have a special training in his own special business. In the near future the man with the old-time methods will be completely outclassed by the man with a training in his pursuit. The day is not far distant when the bright boys and girls will not leave the farm for the more active life of the cities of today. The successful operations on the farm require the close, careful and shrewd thought that is demanded by cities' various complex lines of business. Head work as well as hand work will find such a happy combination that many a bright fellow will be drawn from the city and rush to the more tranquil country atmosphere.

THE AVERAGE BOY.

MRS. W. J. BOURNE, BEFORE KOSSUTH COUNTY FARMERS' INSTITUTE.

"A mother once owned just a common place boy,
A shock-headed boy,
A freckle-faced boy,
But she thought he was handsome and said so with joy;
For mothers are funny you know,
Quite so—
About their sons' beauty, you know."

From the amount of time, thought and talk, that parents, teachers, and even preachers give to the bad boy, the unruly boy, and to the influence of said boy, I sometimes wonder if he is the great element on which the future of our country depends. And of "bad boy" when all is said, we not only mean vicious, but uneasy and troublesome. Our bad boy is no brighter than the rest of the family, or of the school, but we are so bent on propitiating him that every performance leaning towards good is amply rewarded.

Friends, do you remember the story of the "Prodigal Son;" how he was wept over and rewarded? Did you ever hear a preacher preach on the "Prodigal Son"? Of course you have, a score of times. Did you ever hear one preach on the "Average Boy" who stayed at home, fed the hogs, and put up with the crankyness of his father day in and day out until the prodigal arrived home? In my mind I have no doubt he killed and dressed the fatted calf, and maybe the old man borrowed money or him to buy the ring that was placed on the finger of the prodigal son. No, I never heard but one sermon on the "Average Boy" who stayed at home with pa.

Now the kind of boy that this paper is supposed to be written for is just an ordinary, good natured, whole souled boy. Noisy I hope a litte, inclined to domineer, not as neat as auntie would like to see him, but generous; kind to animals and little children, loves a dog, considers the 4th of July a much greater day than Christmas, excepting the toys. Looks upon girls as a necessary evil, in the same category as teachers and stiff collars. The biggest man in the country next to Pa is the engineer he saw on the engine the day he went to see grandma. And if it wasn't for Ma and old Towser and the baby and Sis, for when it comes to girls of his own home, that spark of chivalry born in all boys will peep out just a little, he would run off and be an engineer. The home strings around a boys heart are stronger than we think sometimes.

Now, what are we to teach the average boy, that we can fit him for the great arena called Life? First, obedience, and always obiedience. The sum and substance of all education is obedience. As the human race rises in intelligence the ways of claiming obedience are changing. For the sake of the child's future, not only for his happiness and the happiness of all connected with him he must be taught obedience to right, whether he understands it or not.

Teach him as soon as he is old enough that obedience is not restraint but that it is freedom, and that freedom is not license, but balance of justice, and until the average boy can understand this he must obey if possible through love. I have only pity for the child who obeys only through fear. Where people advocate breaking a boy's will, they know not what they do.

The first action of a child is impulse and an act of a child means an end, although we cannot see the end the child has in view, and the life worth of the child depends upon the worth of these ends. It may be years before the child realizes himself how he should accomplish this. He may resist until physically exhausted, like a game cock, but his will is not broken. But while we have been writing on obedience, our average boy is growing older. Boys don't wait for theories; they are practical and every day facts.

Suppose we have him fairly well drilled in obedience to my way of thinking. You now have the first factor in a noble manhood. But you notice slang seems to creep into his conversation; you wonder if the last hired man swore around the barn. (Of course his father doesn't.) And you wonder if he uses slang before you and oaths at school. Then your neighbor tells you that her John never swears, and you think, is there any comparison between her stupid John and your bright Charley who learns good and bad both as readily. And then you think how the last day of school Charley looked so bright and you were so proud when he stood on the platform and delivered "The Charge of the Light Brigade" that he had learned so quickly, and Mrs. Brown told you going home that she did not approve of declaiming, as it made them so bold. You felt just a little anxious for fear your Charlie was a little more than an average boy. "Uneasy lies the head that wears the crown." Ah! More than uneasy is the head that wears the crown of mother.

And now comes the question of the embryo man. Temperance, economy, truth and justice must confront the average boy. Then he must know what goes to make the physical boy stronger and better, and right along with these lessons of morality. The boy may have naturally a strong physique, so much the more danger that he may harm it by deeds of strength to show his admiring comrades what he can do. In these days of college athletics, when the papers are full of football, when the captain of the University team is the most looked up to man in town, no wonder our high and grammar schools emulate them.

Our boy must be taught that he is wonderfully and fearfully made. He must be taught that the pen is mightier than the sword and that his body is for use, noble use and not for abuse. Teach him that bodily exercise is a necessity to bodily strength and virtue, but all work or play must be tempered by good, sound sense.

Now teach him that he must think carefully and honestly, and that the one essential of a good strong body is a pure body. In a word teach him temperance not only in drinking, but in eating. Volumes have been written on intemperance of drinking, but few on the baneful effects of intemperance in eating. Our average boy must know the effects of certain articles of food on his system and why athletes are kept on such rigid rules. I solemnly believe that intemperance in eating is one of the roads to intemperance in drinking. Then teach him the great lesson of temperance in drinking. If possible make him by example, by precept, by any way most helpful to the boy, to be a total abstainer. Show him the effects of alcohol on his body, his mind and his soul. One of the best temperance lectures I ever heard was these few words: "There is nothing funny in intemperance." Teach him not to laugh or rail at a drunken person. The average boy is a social being and it is from this phase of his make-up comes much of the danger of intemperance. He must be with other boys and from a mistaken idea of being one of them he learns much that he really in his heart despises.

Our average boy must now be fourteen or fifteen. What a problem. He is comparatively speaking a good boy. He begins now to be a little more particular about his hands, his ears and his clothes. He has been known to give a girl, on the sly, an apple, and he takes a little interest in St. Valentine's day. But these are only minor attractions beside a foot ball or base ball game. I hope the teacher where he attends school is a good young fellow just such as you are in hopes your average boy will be. Ah! What a help, what an encouragement, not only to the boy, but to you and the community. Our boy is studying history now for a lesson in patriotism. How proud he is that he is an American citizen. He begins to take interest even in the election of school director. He now learns the language of our flag. Teach him what the flag stands for, why it is striped with white to show our love of purity. Show him what a pure life means to a boy. Show him how it is striped with red so it would gleam as his life should gleam. Show him how the great field of blue that represents the strength of our country and the stars that glitter in the twilight and emblazon the morning. Teach him to honor the flag and fight for it if need be.

Of course we take it for granted that our boy is polite as boys go, but now he begins to think a little of etiquette himself. He watches persons whom he considers a model, conduct themselves at church, at the table and on the street. His ideal may not be yours but do not laugh at him, encourage him to look further and higher and not confine his ideal to so small a compass.

He now, probably, will try his first cigar, he may have tampered just a little with tobacco before, but on the sly, and if he wasn't afraid the other boys would laugh at him he wouldn't have tried but once. But this is different; he considers himself quite a man and a cigar seems to be a necessary adjunct. Maybe years ago you have told him that if he didn't smoke until he was twenty-one you would give him a watch or a team or a hundred dollars. That may help some toward helping him to resist, but you must somehow plant in that boy's mind, for he has one now, that it would be better for his body, for his whole being not to use tobacco. You can coax, you can bribe, but in the end it is his own pride and self respect that will conquer if conquered he is.

And now he needs spending money. I am taking it for granted, you see, our boy lives in his own home and is in school and maybe he works in vacation. Years ago he should have been taught economy and that, one hundred cents make a dollar, yet until now he has not had much chance to practice it. Father has bought his clothes, his books and given him a little spending money according to the nature of Pa, and mother has given him a little more when she though pa was a little too close. So on the whole our boy has had a fairly good fourth of July and at a picnec and so on. He begins now to wonder if he hadn't better work out summers. If he lives on a farm he thinks maybe neighbor Jones needs him. If in town he looks with envious eyes on the delivery boys. And now, if ever in a boy's life, we are confronted with an enigma. No one has yet in theory or practice ever solved it. In a large family the older boys must leave school at least part of the year. In our cities with factories and shops the question is solved, the boy when past school age goes into some trade. But in our small western towns as on our farms the question still remains. Do I advocate a college training for all farms the question still remains.

Do I advocate a college training for all boys? No. But I do advocate more than what is generally called common school education. I believe in the old fashioned lyceum for our boy now, where orators were made and lawyers born, where good order prevailed and boys were taught to debate, to speak, to think quickly. I believe the old fashioned lyceum did for the boy who did not go to school after he was sixteen or seventeen, what no other training could do. I wish I could impress on every mother and teacher the importance of being able to read readily and understandingly. Then our boy would have pleasure in reading and in our days of traveling libraries the country boy is almost on a par with a common town.

If your boy is to be a farmer give him the advantage of Ames. If of a mechanical turn of mind, the Ames workshop. If you wish him to enter the world as a merchant send him to a good commercial school. Don't handicap the boy with the idea that all places are full. Never did the world call more earnestly than now for men skilled in some one thing, and every year the call is stronger and it is for your average boy to answer.

Has your average boy ever been away from home? I don't mean to visit his grandma or his uncles or his aunts. I mean really been away. Did he ever take his grip, buy his own ticket and go off for a short trip. Did he ever go to the state fair, ever see Ames college or Minneapolis. If not, why not let him go. He will come back so bright and newsy, he will tell you so much that he has seen and heard, that you will wonder why you didn't let him go before. Did you let him go back to your old home where you lived before you came west to this wonderful state of Iowa. See the old school house with initials and, well, perhaps they are not his mother's, but never mind our son has not reached the sentimental age yet, he will be more interested in that long hill you used to slide down and the fields where you did such big boy's work, or the shop where you worked such long hours, for you worked hard when you were a boy. Yes, let him go back if your record as an avearge boy will survive it. What good times you and he will have when you talk it over. Yes let him bathe in your old swimming hole where you and Jack used to run away from school and go swimming. It is only two years now since you whipped your boy for doing the same thing, but he has forgiven you long ago and so we must.

Maybe our boy will buy a book on the train. We hope he has money enough to. It is just a cheap book, hardly fit to read but it looks manly to come home and take out a book and say: "Just a book I bought on the train." I hope before he left home he has read some, just a few good books, and of course you take a good magazine, all well regulated families do, and then he will tell you the different books he read when he was gone, for some of the families he visited read a great deal and in one place all the boys had a magazine of their own. So he proposes that he and average boy No. 2 both take a magazine or paper next fall. He tells his mother that cousin John's boys all use tobacco, but that cousin Henry's don't and that he has made up his mind that he shan't, for their home is so nice, so much like our home. I had a good time but I am glad to get back, and he will tell his mother all about a girl he saw back there, and how nice he thought her, but one Sunday he saw her chewing gum in church and then he thought of his mother and how she would look at a girl chewing gum. He never tells pa this. Mother smiles but it is a sad one, as her average boy is getting older. Whittier heaped blessings on the barefoot boy let us raise our hats to the average boy; he is yours and mine. What do we not wish him, what would we give him if we could? Health! Yes, best of all God's blessings a good strong, active body. Wealth? Yes, a moderate allowance, but with it a mind capable of using it to the best advantage for himself and others. Reputation? Yes, for we all wish our boy to be of good repute in the community. Education? Yes, in the line he has chosen for his life's work. Well, what else? Is that all? No.

The foundation of all this must be character. There must be a seed time of character and a growing time, yet it will grow almost unconsciously. Character is really fruited from 12 to 20 but it is a slow growth. Holmes is credited with saying, "If you want to form a good character begin with his grand mother." So much depends on the home in influencing the character of the boy, and that we are told depends on the mother. But for certain years his father is his ideal of manhood and that is especially the case if the father has attained that success so dear to American hearts. How can we train our boys is no new question. It has long been in the minds of the people, but every year it seems to mean more. Character building means all that there is in life. We have always wished that they be educated in virtues, that they should be brave and just, truthful, honorable, but mothers have not known enough of the nature of human beings to combat successfully with this question. Motherhood must include more than housekeeping. Home making is housekeeping and a hundred percent more. And since character is more than body, she must be prepared to educate and care for more than the body. So our average boy must have more than an average mother.

THE POSSIBILITIES OF THE YOUNG MEN OF TODAY.

BY MRS. E. J. ORR BEFORE HARRISON COUNTY FARMERS' INSTITUTE.

There never was a time in the worlds history when high success in any profession or calling demanded harder or more earnest labor than now. Men can no longer go at a single leap into eminent positions. Opportunities do not spring up spontaneous like weeds. It is impossible to succeed in a hurry.

But for the young man with the right material in his make up there are still many possibilities. But he must not expect to find them in the saloon nor by the fireside amid the fumes of tobacco smoke. There are scores of young men all over the land who want to accumulate wealth and yet every day scorn such opportunities as really rich men would improve. They are not willing to begin at the foot of the ladder, but half way up or even at the top. They expect their parents to start them where they leave off not willing to stand the arduous struggles the parents have endured.

To begin at the foot of the ladder and work slowly to the top seems a very discouraging process and here it is that thousands of young men have made shipwrecks of their lives.

First of all a choice of business or occupation should be made and made early with a wise reference to capacity and taste and then the youth should be educated for it and in it as far as possible and then he must persue it with industry, energy and enthusiasm.

Having an ideal in life is what makes the man. Whatever a mans' talents and advantages may be with no aim or a low one, he is weak and despisable, while with a high aim he is respectable and influential. Without some definite object before him, some standard which he is earnestly striving to reach, he can not expect to attain any great height either mentally or morally. Mankind everywhere are desirous of achieving success of making the most of life, but many have not the will power to make the necessary exertion. Don't think I measure a mans success by the number of dollars he accummulates, for many a rich man has died a failure. The world is no better for his having lived in it. We are in the world to make the world better, to lift it up to higher levels of enjoyment and happiness. It is a law of our intellectual and moral being that we promote our own happiness in exact proportion that we contribute to the happiness of others. God in his infinite goodness has so ordained that one can not work for self alone and be successful. He may accummulate wealth but he is not happy, and true success consists of being happy. In former times it was considered successful to get rich but fortunately there is a new generation of people who find opportunities thick as weeds for doing something nobler than becoming rich. A great drawback with many of the young men of today is they are not taught to work while young. They are sent to school as soon as old enough and are not trained to any manual labor or given any responsibility thinking that education will carry them through life without any further effort, and education in the true sense of the word will, for the real meaning of education is development. It is not simply instruction communicated by the teacher, but is is a waking up to the latent powers. Education has reference to the whole man, the mind the body and the heart. Education, strictly speaking, covers the whole area of life. Education accomplishes wonders in fitting a man for success, but we forget sometimes that it is better to have the mind well disciplined rather than so richly stored. A young man seeking a position today is not asked what college he came from but what he can do. It is special training that is wanted. Most of the men at the head of great firms have been promoted step by step from the bottom. Some young men get the idea that it is not respectable to work and imagine there is some disgrace belonging to toil. No greater mistake could be made. Labor may be a chastisement but it is also an honor and a glory. All that is valuable and precious to man is acquired only through labor. Without it civilization would soon relapse into barbarism. Young men should also be educated in true economy, as this is the grand element of success in acquiring property. But to pratice this, one requires great resolutinon and self-denial, but it must be done or poverty will accompany you through life. Young men who are just starting out in life should make it an invariable rule to lay aside a certain proportion of their income whatever that income may be. In early life it should be the pride of young men to see how little they can spend on dress and yet present that neat and tasteful appearance which is desirable. To judge from the actions of many young men one would suppose that dress was their highest aim in life. It is not only dress that young men spend so much in, but in foolish little things that they could well do without. Not; long since I heard one boasting that he had sixty good neckties and that he spent ten dollars each month in candy and other confectionaries. Now no one has any use for so many neckties any more than a dog has for so many tails. And as for candy, his health would be better without, but he was probably trying to buy some girls affections with the candy. Premit me to tell you that a girl that can be bought with candy is not a very valuable investment, and he is liable to wish before many years that he had never invested. It is all right for people of means to have such things if they choose, but I am speaking from the stand point of the average farm boy, as that is what your committee wished me to speak from. I venture to say there is not a well-to-do, prosperous man in Harrison county but has made his start by economy, industry and self denial, for, if a man has means left him, unless he practices these virtues he will soon learn that his fortune has slipped away from him.

People of sterling worth and character are apt to have a feeling of contempt for one, who, by his faultless dress and spruce manners shows that he is actuated by a "dudes" view of life. A coat with the mark of use upon it is a recommendation to people of sense, for the best coats in our streets are worn on the backs of penniless fops and men who never pay their debts. Rev. Madison Peters said that a dandy reminded him of the cinnamon tree because the bark is worth more than the body.

In a large open square in the city of New Orleans stands a fine marble statue erected to a woman who never owned a silk dress or wore a kid glove, but this monument was erected by the city as a thank offering for a helpful, unselfish life. Some parents think their sons have no chance because they have not means to send them to eastern colleges to finish them up, as they term it, for some business or profession. I know I shall be bitterly censured when I tell you that I believe it would be better for the young men and also for the country if fewer young men were sent to eastern colleges. I have great faith in our grand free schools and believe that any boy of the right make up can obtain an education in the schools of Iowa and thus keep at home thousands of dollars that would make possibilities for young men. When parents send their boys to eastern colleges they are not sure but they may be spending their time learning that barbarous game called football or some other thing as useless, or they may lose their lives before they get through that foolish, degrading practice called hazing. Boys and even girls are allowed in these colleges to carry on performances that are a disgrace to civilization, if newspaper reports are true. If the people of China should practice such things you would be collecting money to send missionaries among them. I will relate one incident that you may all remember, for it happened last November and the account was in many papers. At Kenyon, Ohio is located Gambier college. Attending that college was a young man by the name of Stuart L. Pierson. A college fraternity known as the Delta Kappa Epsilon is one of the fraternal institutions of that college. When young Pierson came to college the first thing to be attended to was to initiate him into the mysteries of this order. First he was made to crawl through the town on his hands and knees while his companions beat him with sticks and stones. Deep abcesses formed on his limbs until he could not walk for some time, but as soon as he could walk they must finish the initiate ceremony, so they took him to a railroad bridge and tied him to the track and went away intending to return and release him before the regular train was due, but when they went to release him an extra train had been scheduled for that fateful night and he was already cut into shreds. But no one could be punished for that dreadful deed for not one of all the thousands of this fraternity would dare to betray the facts of this terrible tragedy. A college education counts for little unless mixed with plenty of common sense.

It was a boy born in a log cabin and without schooling or books who won the admiration of mankind by his plain, practical wisdom while president during our civil war and who emancipated four million slaves. There is success for every boy under our flag who has energy and ability to seize his opportunities. It matters not whether he is born in a cabin or a mansion, if he only learns that character is success and there is no other, for I believe to have a good moral character is the highest success a young man can attain and the work of making it the noblest work on earth. At the time of the Chicago fire many men lost every dollar they possessed, but were soon into business again, because the commercial agencies said they were honest and industrious. This record was as good as a bank account. Character was the con which enabled penniless men to buy thousands of dollars worth of goods. Their characters did not burn up with their stores. The best part of them was beyond the reach of fire. Capacity has much to do with young men's possibilities, one will succeed where another will fail. One is born with good business abilities and resolute will power that will say "I will find a way or make one," while the other simply drifts along. I believe there is much in environments before birth, and if the people only understood how this generation has the destinies of the next generation in their hands they would improve the next generation much more than they will. Men will spend any amount of money and time trying to improve their stock by caring for the dams in the best manner possible, but who ever hears of one that tries to improve the immortal souls trusted to his care by making everything as pleasant as he can for the prospective mother of his children, and the reason that he does not is because he does not know the effect upon his children. I am glad that our grand and glorious President Roosevelt has had the courage to speak in public upon this important subject. Never before have we had an official in high standing that has dared, or at least that ventured to speak on the subject of improving the human race, and yet nothing will pay half so well financially and spiritually in this world and the world beyond. You can not look into the mind of your boy and read the secret message and intentions placed there by the Divine hand. He may not be intended for a farmer. It is no reason because you are one that he should be. Many a boy's aspirations and inclinations have been silenced forever by ignorant parents persecuting them by calling them shiftless and lazy when they were as is often said, "round boys in square holes" and did not fit, and no one can be ideally successful until he finds his place. A boy will seldom decide on his occupation before he is sixteen, and then he is very uncertain what his calling is. But while he is in this uncertain stage don't disgust him with farm life by constantly complaining about failure of crops and hard times if you wish to remian on the farm.

So many are now telling young men there is no chance for them in Iowa, they will have to go west or to Canada. The west may have some advantages that Iowa has not, but I venture to say that Iowa has more that the west has not. We are in the best portion of the earth; from the Atlantic to the Pacific there is no better country than ours. We have the best soil and the greatest returns for the least labor and expense. Much of the eastern states is barren and rocky and must be fertilized and much of the west is parched and dry. You would not be surprised that our land is dear if you only consider how comparatively small a portion of the land of this great country is fertile. You can ride for days on the different railroads through land only fit for mining or raising cactus, and all the population must be fed from the fields of the middle states. This is the grandest country on the globe for a poor man to make a start. I can well remember when my father worked hard all day for fifty cents per day, and he said that was more than he had been in the habit of getting in England, and I have heard men from Sweden and Denmark say they have worked many a day for ten cents per day in those old countries. I am quite optimistic and can see limitless possibilities for our country. Do you ask how they can be obtained? My answer is to give the right of suffrage to women so they can cast their votes with the men of good morals (as they seem to be in the minority) and thus exterminate the greatest enemy this country has ever known or ever will know, the enemy that makes more poverty, more suicides, more broken hearts and deserted homes than everything else combined—the dreadful traffic in liquor and tobacco.

THE RELATION OF THE FARMER AND BANKER

EDWARD F. LARSON, BEFORE HANNCOCK COUNTY FARMERS INSTITUTE.

In speaking of the relation between the farmer and the banker, reference is made to those living in rural districts, where the leading industry is farming, for they rarely deal directly with each other in the large cities, because it is inconvenient.

Few realize at first thought how closely the interests of the farmer and the banker are connected and how beneficial the one is to the other. If they were to suddenly cease doing business with each other, the result would be very plainly felt; in fact, it would be a public calamity with very serious results.

It would be absolutely impossible for the world to get along without the farmer, for every one knows that the bread and butter for every human being comes from the farm. The business of farming has progressed with years like all other business pursuits, until to-day we find the industry so highly advanced and so closely interwoven with practically all other industries, that to separate it from other lines of business would be very difficult and a disastrous thing to do. It would ruin the business of the whole country, and prosperity would be a thing of the past.

Farming antedates all other business pursuits and so long as time shall last, it will continue to be the basis of all prosperity and the source to which we must look for our daily bread. It is interesting to note how quickly the effect of a good crop is felt now-a-days. It affects business like no other factor. The good news is flashed on the wires all over the world, and it immediately stimulates every conceivable line of business. It promotes confidence like nothing else can do and is the very elixir of life in the business world. There is nothing else which bears so great an influence on business as the financial condition of the farmer. His prosperity is the basis of all prosperity, no matter what line of business one may be engaged in. He who thinks the farmer has nothing to do with the business and success of this world is sound asleep.

The world has always been and always will be dependent upon the farmer for subsistence, for there never has been a time in the past when farming was not the great leading industry and it will always continue to be so. This, however, is not true of the banker in the same sense, although we find traces of him at a very early period. In Bible times he was called a "money changer" and to change money was in fact all he did. Later we find him erecting large, strong vaults and in them was kept money left by depositors who bore the expense of management, in proportion to their deposits. The banker at that time was really a servant of the depositor and was paid merely for receiving and guarding the money. It was an expense in those days to deposit money with bankers, but some place had to be arranged to keep it safe beyond the reach of burglars, fires, and the elements.

However, as time went on, these bankers began to notice that depositors never drew all their money at one time, and that they could just as well loan a portion of it with comparative safety. It was at this time that the bank began to develop, until to-day we find it one of the strongest and most influential forces in business. From that time interest was paid on deposits left for certain periods of time, and is ceased to be an expense to the depositor, but on the contrary it was profitable and a great convenience. Nearly all banks in this country pay interest on deposits left for certain length of time, because they can loan it at a higher rate of interest. It matters not whether your business is large or small, wheher you are rich or poor, you will find the bank a great convenience, for there are few of us who do not at some time handle money. Banks are in a sense public servants and all classes of people can make profitable use of them.

We have often heard of people keeping money at home in an old stocking or burying it in the ground, but this is seldom done now, for they have found out that it is a great deal safer and more convenient to deposit it with the bank on interest or subject to check. A very large percentage of the world business is done on credit. When the farmer markets some of his produce he seldom gets the cash for it, but is handed a check on some bank, which he cashes there or has it placed to his credit, and he in turn checks against this credit to pay his bills. It is a great deal more convenient and much safer to carry a check book than a lot of money, for it is often hard to make change, and the checks are receipts in themselves and the stub leaves a perfect record of payments. You can not loose your money in the bank, nor can you part with it, except by written order.

The bank has grown to be such an important factor in business that no one thinks of going into business of any kind without keeping a bank account. The very condition of the country in which you live is reflected in the bank statement published. When you find banks loaded with money it is certain that the farmer is thriving, and, on the contrary, when you notice banks are not making any loans and show small cash reserves, it is a sure sign that the community in which the bank is located is not prosperous at that time.

This applies with greater importance to the city banks than it does to those in the country. When Wall Street speculators see that the bank statements show no surplus funds, he seeks to unload his investments or stops buying, and this forces prices down and vice versa. Stock brokers and moneyed men watch the bank statement very closely, for by it they decide their course of action.

The bank draft come into such universal use that it is bought almost exclusively for sending money to all parts of the world. Arrangements have recently been made with bankers of all foreign countries by which the draft you buy at your local bank brings the actual spot cash to the very door of your relative or friend in the old country. All kinds of business men use the bank draft for paying bills in any part of the country, and have found it to be the cheapest, safest, and most convenient way of sending money. The banker's business is to handle money to the best advantage consistent with absolute safely, and they have covered the earth with so complete a net work, that to transmit money to any part is a very simple and inexpensive matter.

The great point that should be emphasized in connection with banks is that when the money of a community is deposited in them, it works as a great advantage to both depositor and borrower for, ordinarily speaking, a bank has money to loan in proportion to its deposits. This matter of depositing money with banks is putting money into circulation in its truest and fullest sense, for the banks will immediately loan a part of the deposit. Furthermore, the more money banks have to loan, the lower interest rates become to the borrower, and most people have to borrow money once in a while, and many find it profitable to borrow money most of the time, for they can make a nice profit above the interest they must pay. If money was to be kept in hiding, like the custom was not so many years ago, there would be little use for banks, and those who wished to borrow would have to go to some friend or relative. This, however, has always been a rather unsatisfactory way of borrowing, for often the lender needs the money when it is impossible for the borrower to pay and it works a hardship to both.

The relation between farmer and banker should be one of a confidential nature, for it is only by close acquaintance that either gets the fullest confidence in the other, and confidence is a very essential thing in business. Without confidence it would be impossible to do any credit business at all. We must have faith in each other, and it is just as necessary that the farmer have confidence in the banker as it is for the banker to have confidence in the farmer. The importance of good credit can not be overestimated and should be guarded as zealously as any other possession, and if the banker loans you money he compliments you in believing that your note is as good or better than the cash he hands you.

The depositor has just as good a right to know how the bank is situated financially as the bank has to know the financial conditions of its patrons. It is for this reason that National and State banks publish sworn statements periodically, as often as required, so that its patrons may see for themselves their condition. These statements show how much capital and surplus,. how much deposited, how much loaned out, and ho wmuch cash is on hand. Every bank should in justice to its patrons publish these sworn statements, so that all may know something about the bank they are patronizing. Advertisements in newspapers or magazines carry but little weight unless sworn to by some officer of the bank. Most people are like the man from Missouri. "they have to be shown," and in all justice they should be.

There are people who think the farmer has an easy time of it and that all he has to do is to harvest the grain and bring it to market. If such people were put on farms they would starve, for they know nothing of the hard, constant work the successful farmer must do, nor how careful he must attend to the various duties in order that nothing may go to waste, so as to make both ends meet. It used to be an old saying that if a person was good for nothing, that his place was on the farm, but we have long since learned that it takes as much brains to run a farm successfully as it does to run a bank or any other business. The farmer of to-day has to deal with many perplexing problems that did not arise in the past, and in order to cope with them to the best advantage, he must study his business very carefully and keep posted.

A few years ago we heard but little of poor crops, because in those days farmers did not try to make corn grow under water, but farmed only the high places. But now-a-days we must make every acre yield something, for land is steadily rising in value, and in order to make the farm pay in proportion to the rising value, every acre must produce a proportionately greater income.

The greatest problem that the farmer has to solve is, how to make his farm pay the most, and this is no little task. Many times there are improvements which ought to be made, and which if made, would be of great advantage and net a handsome profit, but he may not have the ready money to spare. If he has a good established credit at the bank, he can very easily borrow the amount necessary and make the improvement which may pay him ten times as big a profit as the amount of interest paid for the money borrowed. This is shrewd business.

As a rule it is a good policy to avoid going into debt, but when a farmer's judgment tells him that a certain improvement, such as tiling for instance, will net bim a big profit and he can see that in the end it will soon pay for itself, he should by all means make that improvement, even though he must go in debt for it. The other day two farmers were talking about cream separators; one already owned one and the other wanted to own one, but since he would have to go in debt for it, he went without. The farmer who owned one, however, went to work and explained to his friends that he also went in debt for his, but that it soon paid for itself and was still just as good as new. He convinced his friends and now he, too, owns a separator and has it partly paid for.

A bank can be of great service to those who wish to borrow money. tI often happens that the roads are so bad that the farmer cannot haul his grain to market when he wishes to pay certain debts, or it is possible that the markets are so low that it would be sacrifice to sell, or it is possible that there may be no market at all for his produce, or it may be that he has not the time to haul it, and there may be many things which would make it not only inconvenient, but cause a loss of money to sell when he had to meet the debt. It is in cases like this that the banker should help his farmer friend until conditions are more favorable. No banker who values the patronage of a customer will refuse help in such cases. The interest he pays for the amount borrowed is nothing compared with the loss he would sustain if he had to sell under unfavorble circumstances.

If it were not for being able to borrow money of the banker for long time at low rates interest it would be almost impossible to buy land, for very few land purchases are made without some bank furnishing part of the money because not one man in a hundred has sufficient money to pay all cash. There are very few farms that have no mortgage on them and when one stops to consider how many farms there are in this country, one has a good idea of how important a part a bank plays in the progress and development of the country. It is astonishing, however, to note how many farmers have been able to pay off the last cent of debt on their farms in the last five years. It speaks very highly for the ability and good management of the farmer who is so fortunate.

The greatest problem with which bankers have to deal is how to loan money safely; in fact the strength and success of the bank depends mainly upon this one point. In order to pay interest on deposits, pay taxes and salaries, it is necessary that the funds be loaned without loss. To do this the banker must use his best judgment, so that he may be able at all times to meet any demand made upon him by his depositors. This is no small trick and if the man behind the counter has not the nerve to say "No," he is a dangerous man for the bank and its depositors, and has no respect for those who have taken enough faith in him to leave their hard earned money in his care. To betray the trust reposed in him would be worse than treason.

Many people think it is a snap to run a bank and that the banker's path is strewn with roses knee deep. He is often pictured as sitting in his office with heels upon the desk, with a cigar in his mouth and looking at the world through the soles of his feet, content with clipping interest coupons off his many bonds. Truly this is an optical illusion of the worst kind. Many people worry themselves greatly over the one little note they may hold against somebody, but the banker has thoussands of such notes with perhaps as many different borrowers and if he was not gifted with good judgment and had not a good supply of that wonderful thing, confidence, he would pass many a sleepless night. It seems to be a popular idea that bankers reap a harvest during hard times, but nothing could be farther from the truth. Hard times affect the banker like poor crops do the farmer. Deposits are much lower in hard times and the banker has less money to loan at interest.

The successful banker is he who keeps an eye single to the interest of his bank and guards constantly the trust reposed in him by his patrons, and see to it that every loan he makes is as good, if not better than the money with which he parted. The banker, like other men, is human with human sympathies, and it is often his undoing if he lets them get away with him. When a poor man in distress applies at the counter for a loan, making an appeal that would melt a marble heart, but knowing full well that he can not repay the amount, it is hard and seems heartless to refuse, but to do so would be the same as losing it. It is for this reason that it is almost an impossibility for a banker to be what is called a popular man. If the bankers are not, above all, safe, honest men, capable of loaning their depositors' money without loss, the country is in danger. The almighty dollar is sought after like no other one thing in this world, and the banker is constantly made a mark by burglars, confidence men, promoters of all kinds of schemes with smooth, oily tongues and a beguiling smile, condescending to take him in on the ground floor and make him rich in a day. They are always trying to persuade him that they have something better to invest in than a good farmer's note.

Such men always remind me of a concern in Chicago which made artificial limbs and it seems that some one had told them that a young man at Forest City was in need of an artificial leg. They wrote him regarding the matter, giving him glowing promises and description of their artificial limbs, and solicited his order on trial. The young man, being a born humorist, replied, stating that it was true he was in need of a good leg, but so long as nature had provided him with a pair, he hesitated in trying their product, even though one of them was somewhat unreliable, especially in the neighborhood of a saloon. The Chicago firm replied, however, that in spite of the fact that he already had two legs, and in view of the fact that one of them was at fault, they suggested that he dispense with the use of faulty member and try one of their limbs, which they would guarantee to give the best of satisfaction, and that the cost of removing the faulty member would be nothing in comparison to the great satisfaction that he would derive from one of their artificial limbs. The young man, however, could not see his way clear to amputate his faulty limb, but promised to speak a good word for them whenever he could. Many of the schemes presented to bankers are about as reasonable as that, And then there is the man selling a gold brick, and the fellow who can not make an honest living, so he resorts to some deeply laid plot to extort money from the banker. Some hold-up man demands that a certain amount of money be paid or, upon failure to do so, his life is threatened and made miserable. Against such men the banker of to-day must be ever on the alert, for to be deceived by them would mean certain financial and moral ruin.

Farmers are had working men, and the better they are acquainted with the banker the better it is for both. In nine towns out of ten, the farmer is a stockholder in the bank, and this is as it should be. It shows how high a regard the banker has for the farmer, for if he were not a desirable stock-holder and a help to the bank, he would not be invited to buy stock. They are as a rule careful, conservative, law-abiding, peace-loving men, living within their means, and are in every sense of the word, model citizens. By their hard untiring work, year after year, they have transformed a wilderness into a veritable garden. A wonderful change has been wrought in this state in the past twenty-five years, until to-day we find a cozy home on nearly every quarter section of land, and a school house on the hill near by. Through careful management and the steady rise of land values, the farmer has come to be absolutely the most independent of all men, and no one is more deserving of prosperity, for if anyone earns his bread by the sweat of his brow, it is the farmer. The demand from the cities for young men who have been raised on the farm is becoming stronger every year, for they have proven themselves more than equal to the responsibility, confidence and trust reposed in them. The great majority of distinquished men who have gained business and political success can point with pardonable pride to humble beginnings down the farm. In fact this is the rule rather than the exception.

Thus we see that it is greatly to the benefit of both the farmer and the banker that they work hand in hand with full confidence in each other, so that no matter what may happen, whether financial panics come or poor crops cause poverty and distress, both may stand by each other through thick and thin, and preserve the credit of the country. Banks have very many desirable customers among business men, but it will not hurt their feelings to say that the farmer is considered by the banker as a most desirable patron, for they, too, regard him in the same favorable light, and neither banker nor merchant can get along without his good will and patronage. The farmer is the best friend that any banker can have, and you will find the banker ever ready and willing to help when he needs help. Many a farmer who passed through the hard times of 1893 and the unfavorable years that have since followed has not forgotten the help he received from his banker friend, and if it had not been for that help he would have faced heavy losses and possible ruin. And nothing pleases the banker more than to have his customer tell him of the money he made with that little amount he borrowed, for the prosperity of the farmer brings the good times back to us with increased activity in every conceivable line of business, promotes good will, good cheer and confidence, the good results of which can never be estimated. Truly the prosperous, warm-hearted farmer is a public benefactor.

HOW MUCH EDUCATION SHOULD A FARMER'S DAUGHTER HAVE?

MRS. E. E. OLMSTEAD, GRAETTINGER, IA., BEFORE PALO ALTO COUNTY FARMERS INSTITUTE.

This is a question that, though it has been discussed often and from many points of view, will never lose its interest; for whatever our favorite theories regarding the best way to feed cattle, most profitable chickens, or how many bushels to the acre, the underlying thought of the whole scheme is, how may we best serve our families, else, much of our hard work ammounts to little more than hard play.

We all realize that our children need some schooling, but we are too apt to regard book-learning as incompatible with farm life, and we fail to see how mastering great problems in mathematics trains the mind to solve greater ones in after life.

We have our favorite stumbling-blocks, such as isolation, lack of means, etc, and after we have solved the bread-and-butter problem, the shelter problem, and the shoe and clothing problem, there doesn't seem to be much left for the education problem, and it is too often left to solve itself the best way it can.

Real education is not merely the filling of the mind with facts and figures, soon to be forgotten; not merely striving to gain the highest marks in the class; it is the proper development of all the faculties, and fitting them for the work God intended them to do. Any thing then, that strengthens or disciplines the mind tends to education. Even the struggle with the problem of ways and means becomes a part of the education itself, particularly if the girl herself helps in the solution and stumbling-blocks often become stepping-stones.

The bug-bear, isolation, is not wholly a bug-bear, since it gives the daughter a chance to grow up at her mother's side, accept her as a confidential friend and share in a measure her trials and responsibilities.

Let her not learn to despise such a life, fraught, as it is, with hard work and self-denial; but rather let her learn that life itself is a responsibility and if lived selfishly it is lived wrong. "She that livith in pleasure is dead while she livith," reads our Good Book, and "Even as the Son of Man came not to be ministered unto, but to minister," so must we, if our lives are to be worth while, learn to live for something better than our own selfish pleasure. So if the daughter can have an education, it is not that she may have an easier life, but a broader, more useful one.

Our little country school with its handful of pupils, double-handful of grades and variety of text-books, is not altogether an unmitigated evil, since it gives the teacher a chance to learn the individual needs of her pupils and what is learned there is apt to be well learned. Moreover, the foundation of more than one good education was laid there. Given, then, an ambition to become a useful woman, no fear of hard work, and a mastery of the common branches, what matter, if our farmers girl does enter high school a year or two behind her city cousin? And if graduation day must be postponed while she goes back into the country, to teach, or do something to help pay for her schooling, it is nothing lost, for at least half of our education lies in learning to apply what we learn. And would it not be better that she graduate at nineteen, able to use what she has learned than to graduate at sixteen with much of the work carelessly gone over? Too young to teach or to assume responsibility of any kind, a period of idleness soon spoils all.

Many of our best teachers are girls from the farm who have earned, at least a part of their own education.

Of course in this day and age of the world, teaching is not the only field open to women, and the girl from the farm will find she is not excluded if she be able and willing to work.

But there comes, from some where, a complaint that it so frequently happens that after a girl graduates, instead of going on and working out a career for herself, she marries. Well, what if she does? Has a married woman no use for education Hasn't the cry of the country always been "Better wives," "Better mothers," "More intelligent homemakers?" How are we to get them if we don't educate them?

On the other hand, some say that educating a woman destroys her taste for marriage. As if any thing on earth could ever do that.

If the home is the corner-stone of the nation, should the educated woman consider it beneath her to try and help make one? To be sure, she may not need a store of Latin or geometry in the management of a home but she will need the mind discipline those studies stand for. Many a time will she be called upon to face a hard problem till it is mastered, as she learned to do over her algebra. And if, in her school work, she has learned to love good literature, she has a fund that will never fail her. She may forget her theorems, and equations but she will not forget the grand thoughts she gleaned from the poets. Her home may be isolated but those who are accompanied by good thoughts are never alone.' She may do without many needed things but she will occasionally have a good book, for she will know that good mind food is quite as important as good body food. Perhaps you have heard this little story but it is worth repeating. A woman came into a store in a lonely little town far out west, and asked for a couple of books for children; one a book on Nature study and the other a good system of penmanship. They were not to be had. A traveling-man present expressed surprise that such books were used in the schools of that remote place. She answered that her children had never been to school; they were five miles from the nearest neighbor, and she had been their only teacher; she had come sixteen miles to get those books that day, and how disappointed the children would be when she came home without them! I think the story ended with the travelling-man taking her name and address and promising to forward the books from the nearest place where they could be procured. But in any case, who would say that that woman's education was useless in such a place? Who would say that it would have been just as well for her and her family if she had had no education? Isolation or society, ballot or no ballot, was she not casting a strong vote for the good of her country?

There is no danger of our girls getting too much education; provided, "with all their getting they get understanding and the education of the heart keeps pace with the education of the head".

A well-trained mind and a true heart for every coming woman. "Give her the fruit of her hands, and let her own works praise her in the gates".

HOW TO BEAUTIFY THE HOME.

G. J. SCHAEFFER, BEFORE WINNEBAGO FARMERS' INSTITUTE.

In driving through the country we find a variety of farm homes, some quite improved while others seem to have been more less neglected, but directly we come to a home which at once attracts our attention. It is well kept, equal to those in town; buildings neatly painted, a beautiful lawn with trees and shrubbery tastily set out, a fine orchard and grove; all of which gives it a cosy and homelike appearance. Next we come to a home where the house is modern but sadly in need of paint; the yard is ungraded and neglected; stock running at large and enjoying a feast in the front yard, destroying the few trees and shrubs which have been set out; also fences and outbuildings are in need of repair; giving everything a shiftless appearence.

Now the contrast between these two homes is very striking, and emphasizes the importance of giving more of our time and thought to the environment of the home. Paint in harmonious colors, trees, shrubs and flowers can be purchased for a reasonable amount, and no one need despair of having a beautiful home, and getting it cheaply, providing we are willing to do the work mostly ourselves. Get material needed, and then repair and paint the buildings; next build a fence and keep stock from house and front yard; then grade up around the house for front lawn, and seed into grass. Now plant trees and shrubs, also arrange for a garden, orchard and grove. After the improvements are completed and planting done, not much time is required, only a half hour now and then in keeping things up seeing to the trimming and cutting the lawn; and you will have a home admired by everyone, a great satisfaction to yourself and family.

When we begin to plan a location for our buildings, we should consider it from three different standpoints; healthfulness, convenience and attractiveness. Care should be taken to drain well the site on which we mean to build. No matter how attractive the home may be if it is located before a noisome cesspool everything is spoiled besides a breeder of disease. The draining of this land would cost less than would the doctor bills. A rising ground, sloping every way, gives your home the most attractive appearance. Also consider the convenience of the site to the barn and other outbuildings, its nearness to them and it nearness to the road. About a quarter of an acre, or perhaps a little more, should be set apart for flowers and lawn. Do not fill the center of the lawn with anything to obstruct the view from the house, nor follow straight lines in planting. Would advise planting a few evergreens such as white pine, Norway and blue spruce, also a few other lawn trees, besides some hardy flowering shrubs.

Now might arise the question, does it pay? I think it does, in more ways than one. In the first place, the comfort alone which you may take in owning such a home, more than pays for all time and money expended; and by adding a few games and amusements, you have succeeded in keeping the boys and girls on the farm. Third, in case you wish to sell, you will realize enough more to pay you twice for all extra improvements.

WOMAN'S SHARE IN THE HOME.

MRS. LENA WILLIAMS, CORWITH, IOWA, BEFORE HANCOCK COUNTY FARMERS' INSTITUTE.

I take it for granted a share in the home means a share of the work as well as the profit. We could not expect to share in the profit if we did not do our share of the work.

When a man marries he expects his wife to share his adversities as well as his prosperity, and to know just what they can afford she should know something of his business affairs, and as a general thing a woman is just as anxious to avoid debt as a man, and would do different a great many times if they knew their financial circumstances.

I think if a woman looks well after her household affairs she deserves an equal share of her husbands estate. If at any time her help is needed out of door and her health and household duties permit, she should lend a willing hand to whatever she can do. And if necessity demands it I think a woman just as much of a lady driving a binder, feeding pigs or milking cows as doing any other kind of work.

I am old fashioned enough to consider any honest-labor honorable.

I do not mean to say that a woman need do all these things to earn her share in the home, but she may do all these things if she likes and can spare the time.

I think every woman owes it to herself to spend at least an hour each day in the open air or just as much time as she can, and you had just as well attend to your flowers or garden and care for your poultry and make your daily airing a source of profit as well as pleasure.

Take the little folks with you and teach them to observe and think of what they see. Let them learn something of insect and plant-life; it will take very little of your time and will help them with school work later on. Early install in their minds the love of *principle* and *truth.*

I consider this especially a woman's share of the work. And I am sure I speak in behalf of all Mothers when I say, all the profit we ask is they grow up noble truthful men and women.

Conditions have changed since the age of our Grandmothers, when home-making was all that was demanded of a woman. Today she is expected to be a "general knowledge box," as well as a home-maker.

The old families, who we all love to claim as our ancestors, was established by the mutal co-operation of husband and wife. It was the mothers who had the principle care of the children; the father providing for the family.

Modern schemes to tempt men from the narrow way had not-been invented and women were not clamoring for more rights and falling in love with their coachmen.

I do not care to vote and think very few women would vote if given the privilege unless at the school elections in which all women who have children to send to school are very much interested. I think the men capable of looking after the Government without our help.

Now can you give me a good reason why the property should not be divided equal between husband and wife. Can he hire the work done she is expected to do and does do. If you have a good fat-pocketbook you can hire a housekeeper but it makes a vast difference in the cost of running the house, for without personal interest, many of the little economics of house-keeping will not be practiced.

The part Longfellow has written "Homekeeping hearts are the happiest, for those who wander they know not where are full of trouble and full of care:——To stay at home is best".

THE FAMILY PURSE, WHOSE IS IT?

MRS. MATT PARROTT, WATERLOO, IOWA, BEFORE BLACK HAWK COUNTY FARMERS' INSTITUTE.

When your secretary wrote me that you would like to have me with you again this year, he asked if I had any new topics added to my repetoire. I answered no, that I regarded those I arranged last year the same as the alphabet in reading or the eight notes in music capable of having any number of changes rung upon them.

The most soul stirring hymn and the coon song like depend for their melody upon eight musical sounds.

The finest oration, the most brilliant sermon and the silent doggerel verse have only the various changes of 26 letters. These have been considered sufficient for many years to supply the literary and artistic wants of all people. That your committee selected "The Family Purse and Whose It Is," for me to talk about, makes me think they want to be enlightened as to its ownership.

When a man proposes marriage to a woman and she accepts they are considered, as we say engaged, that is, they have drawn up a contract, but the man is not yet responsible for any debts of the woman and each party is at liberty to withdraw from the bargain any time, often at the risk of a breach of promise suit, I allow. But when once their contract is sealed by a minister of other officer of the law in presence of witnesses it takes considerable interference of the law to annul such contract. In a business venture each party agrees to do thus and so, are bound by specified conditions. Certain labors are assigned each and a corresponding salary is named, a rightful pay for services rendered.

In a marriage contract each party is also bound by specific conditions. The woman to love, honor and obey. O, what a risk she takes, when she blindly makes that promise. The man to cherish and protect and in many cases he adds that with all his worldly goods he will her endow. How often this last clause is a dead letter.

The matter of a salary for either party is never thought of. If the woman has been a wage earner before marriage it soon becomes a serious matter to her to be dependent upon some one else for every nickle she spends. Few husbands there are who make an allowance out of the income for a wife's purse. They mean well, no doubt. They think and say, why Mary can have anything she wants that I can afford. She can get credit at the store at any time. what more does a woman want? Women feel a delicacy about asking for money, and credit at the store does not meet all the wants of a woman now-a-days.

A man in his daily round of business has frequent calls upon his generosity, his public spirit, when ready cash is the only way out of it and he would feel much abused if after working day by day he was allowed nothing in his purse to spend unquestioned as to what he did with it.

Women have these same demands upon them and are often looked upon as means spirited simply because they have no money of their own and do not know when they will have. We hear the remark quite often that since women are so generally in business they are not so ready to marry as heretofore and the reason given they are more independent in money matters, so the need of marrying for a home is not so urgent. This may be true but the woman whose only object in marrying is to gain a home is not generally the woman who will make a home for others.

Marriage should not be wholly a business contract, yet it should have enough business mixed in it to balance the love there is, so that both ends of the plank on the daily seesaw of life will rise and fall rythmically.

We are quite inclined to sneer at the thriftiness of our English cousins when arranging for a marriage with an American but they scruple not to insist upon the marriage dot being well secured before the marriage knot is tied. This is true with titled Englishmen at all events. I do not call to mind any English girl marrying an American man, nor the money value of such a union.

It would not sound well perhaps for a man when seeking a wife to say I will pay you so much a week for your services as cook, laundress, housekeeper and general manager, including possible duties as mother and nurse to our children. We would look aghast at such a proceeding and say how cold blooded. But what about the man who demands all these services and when asked for money to use should surily respond with, what have you done with that dollar I gave you a month ago.

By common sonsent years ago the purse was conceded to be the property of the man. But why? To be sure he may labor hard and his labor pays, but does not his wife too? So often her hours exceed his in number that it has become a proverb. "That man's work is from sun to sun, but woman's work is never done." Why then should she be expected to be contented with just her board and clothes. As man before he marries should have some assured income on which to support a house and a wife. He may own a small farm, have a fund in the bank or have only his weekly salary. The woman may also have some asserts with which to begin house-keeping. If so these are all pooled in a general fund for mutual benfit. If such is the case why does the income accruing from this partnership of assets belong to one member of the firm. No business would last a week done in this way. Most generally a young couple have little to start with, often hardly enough to pay for a license and the minister.

Now suppose in such a case the man earns six dollars a week by his work of 10 hours daily, though now it is but 9 in many cases. If they are wise and thrifty they will hold a council regarding the spending of that money. A portion will be set aside for rent, another for food, another for clothing. The woman does the work in the house, sees to cooking the food so that none is wasted, makes, mends and washes the clothing, beside various other things too numerous to mention, which work will take her best endeavors the same 9 or 10 hours. Now if at the end of the month 50 cents or $1.00 is left to go into the purse who does that rightfully belong to? All to one? No, it is the assets of the firm and should so be regarded.

If there is a man within sound of my voice who thinks, oh! woman's work is nothing, it should not be compared to man's labor, I would just like to put him in the woman's place for one week. Let him cook, wash and iron with poor wood and water hard to get at, take up and beat and put down the carpet, white wash the kitchen wall and scrub the floor, wash dishes three times a day and darn a few stockings in the intervals just to rest him, and perhaps with a fretful baby to care for. I think he would soon agree with old Grimes who tried it "that his wife could do more work in a day than he could do in three."

The idea that woman's work does not pay is a wrong one. There is no work in the world that pays more largely in the abstract although it may not be acknowledged. It is not so much what one earns as what one saves that makes one rich. Generally the saving clause in a home is turned over to the women. They are expected to make both ends meet no matter if the income be small.

In the accumulation of property the result of the co-operative labor of husband and wife, the law gives the man the lion's share and in case of his death the woman can only claim one-third. In many cases, if the whole truth was known, her hands have earned as many dollars as his. Law is not always justice, but we have this to cheer us, Iowa law is more lenient toward women than is that of many states and in this good land of ours women occupy a much higher place than elsewhere. I have in mind a good illustration of the point I wish to make about the value of masculine and feminine labor.

Some 50 years ago a young English couple settled in Waterloo. The man's occupation at home was that of a farm laborer, the woman's, a general houseworker. They had nothing with which to buy land but determined to some day have a farm of their own. So renting two rooms in town to live in, the man would go to the country each morning and break prairie or do other work for farmers, returning at night with the team he hired. The wife, strong and hearty, bestirred herself to do her part and as nothing else presented itself, took in washing, much of her earnings going to pay for food. After a time they had jointly earned enough to lease some land and commenced farming for themselves. While the man raised corn the woman raised poultry. The eggs and flesh of these fowls were taken to market with the golden rolls of butter made by the wife's capable hands. Still the good housewife did not give up her laundry work but continued to do washing for a few families in town. When I first knew them the finest farm in Black Hawk county was owned by this man. His cattle, sheep and even his deer park (this latter luxury he copied from English lands holders at home) were the talk of the neighborhood.

This couple seemed proud of the fact that by the united strength of their arms they had been able to amass not only plenty but riches and never hesitated to tell their friends of the early prairie breaking and washing days. The purse in their case had been a joint affair. Some years ago the man died and as they were childless I quite feared the broad acres might be divided between his numerous brothers and sisters and the wife who had done so much be allowed only her half. But from all appearance a will existed making her secure as she is passing her declining days in luxury. I never see her riding in her carriage but I feel thankful she is enjoying the result of her labors.

As the family grows and sons and daughters enter the home, the family purse ought to become more elastic. Parents are responsible for their children's board and clothes during their minority, but I hold they should do more than that. At a very early age boys and girls can and wish to assist mother and father in their daily work. As a general thing this assistance is considered due the parents for said board, clothing and schooling. The law allows parents to demand all the work of children until of age, if they so choose. This may be law but is it good sense? We often hear it said, children do not know the value of money. How can they the way we teach it?

As soon as children begin to help in the work of house of farm they should be considered wage earners and have a right to a share in the family purse. Let mothers say to the little girls now for such and such services I will give you each week so much. It may be only a few cents but let it be justly counted out to the little worker at the promised time. Let them spend it as they see fit, but have one stipulation that the pennies for church and Sunday School must come out of this fund, not from a special demand upon the parents. In this way they will learn the true value of the words "The Lord loveth a cheerful giver."

Let the father treat his sons in the same way. Many mistakes in spending will result I know. One child will be a miser, another a spendthrift but a comparison of the ways this money is expended in open family council will result I am sure in good. Have the children keep a diary of their spendings. Nothing will bring financial wisdom sooner than to look over an expense account and see, I have spent so much in such a time, now what for, go over the items and the foolish spendings will stand as warming for the future. Nothing makes a man or woman more self reliant than to have money to spend oneself. It gives an independant feeling that nothing else will. $10 in credit at the store may buy more goods but will not give the same pleasure in spending that $5 in cash will.

Another item we are forgetting is the money spent by the average man each week for tobacco and beer. Now I am not going to read you a lecture on the harmfulness of these two apparent necessaries of life. They are likely no more harmful than many other things we humans indulge in.

But let us remember there are few men who do not habitually use one of these luxuries. Now it takes money, not much at a time to be sure, but what man ever thinks of putting aside a corresponding nickle every time he spends one on these things for his wife's share? He would laugh if it were suggested by her . Still it would be no more than right. Some one may wish to suggest to me that a man has more responsibility than his wife. He is expected to support her, is liable for her debts. True, with privileges come responsibilities. A strong framework is needed to support the roof and walls of a house, but if the framework alone is put up the house will not be very habitable, at least in such weather as we are having now. There are many responsibilities in homemaking that do not have to do with earning money, and who can say the wife does not bear her full share of these?

I think the only trouble about the ownership of the purse comes from our false education. From away back in the dim ages custom decreed the man's labor alone merited cash payments, that woman's work was a duty or a love-offering. Time is gradually doing away with this superstition and the woman laborer is more and more being considered worthy of her hire. I have no doubt that many of you will disagree with me regarding the purse's ownership. But think it over after you go home and see if down deep in your heart the feeling will not essert itself, that the labor, sympathy, counsel, the quiet cheering you on life's way day after day of your good wife will not balance all the cash the purse will ever hold.

The man who is the most emphatic in thinking and saying that a wife's work amounts to little is generally the one who hunts up a second wife as soon as he dares after he buries the first.

Then let us say the family purse belongs not alone to the man to draw its strings tightly against any but his own spendings. Not to the woman to want only trifle in foolish and unnecessary expenditure. Not to the children to dissipate its hoarded treasure in riotous living. But like some scared heirloom in which each has a share, to which all may come sure of finding something of their own for their cheer and comfort.

A sense of ownership gives one a feeling of care-taking and guardianship and a desire to add to the hoard we already have. So it will be regarding this composite purse, if all are privileged to draw out, each will or should have a desire to help in the replenishing, that like the widow's cruse of oil the supply may never fail.

HOME LIFE ON THE FARM.

BY MRS. W. J. STEWART, GRIMES, IOWA, BEFORE POLK COUNTY FARMERS' INSTITUTE.

(By a vote of the institute, this paper was selected for publication in the Year Book.)

"Some time since you have spent your evenings on the farm, isn't it?" was the comment the first individual who picked up the program of this meeting remarked in my presence. And so it is; but any of us can theorize a little. Yet, it is the practical we want to get at in these meetings.

While much might be said about the possibilities of increased knowledge and culture through systematic courses of evening study, whole college training courses on agricultural courses or otherwise, or the correspondence plan, etc, we will leave that to some Chautauqua circle graduate, or one who has put theory into accomplishment. But, there is one point which I will try to make, and it is equally applicable to home and village life,—or, home life anywhere,— and that is the cultivation of the possibilities of conversation, cheery bright home talk, an exchange of ideas each has gathered from the days occupation, and observation and reading.

The ability to observe, remember and express thought away to mutually cheer and interest each other means mutual improvemen, combined wih mutual pleasure, crowds out gloom and endears the home relations. How many of us envy the ability of the good story teller, one who can relate an ancedote with charm and sparkle, and not spoil it just when the point should come in.

I think the directing of the childs' ability from the start along this line should be carefully attended to, before the years of self consciousness, and consequent embarasment arrive.

I sometimes think if there were more conversation exercises and less "speaking pieces" in the school plan, results might be better, and the development of the child more natural and graceful.

Many of us find it much easier to take a pen and write our thoughts than to speak orally. Is not this due, in part at least, to our one-sided early training.

In this point of sharing our thoughts conversationally with each other we too gain much. How much more really any thought is our own after we have put it into language. We read the daily papers, a magazine article, a good book, or hear a brilliant speaker. We have received ideas, but have perhaps read or listened without definite purpose, and the thoughts slip away from us. In this, as in all else, we gain as we give. Share the best in what we have gathered with each other. We gain from each other points we have ourselves missed, and our own thoughts are many times definitely and permanently our own, than if unexpressed.

You have seen the memory game, where a tray containing a miscellaneous assortment of articles is passed rapidly around and then each names as many of the articles as he has seen that he can remember. Why not apply this principal to our reading? How surprising it is at first to find how little we can express of what the eye passed over.

Each can do a great amount of self training in this way, and learn to read with greater comprehension. We would not convey the idea in this that the home should be turned into a school room, or a palce of primness, and restraint and repression, but on the contrary it should be the place of the most complete freedom, sympathy and relaxation. Joy and comfort should preside at the fire-side; fun, music, games and laughter be welcome visitants. That the mother was not without discernment who, when asked, how to keep boys home at nights, replied "Have a bright light, a bright room, and everything tasty and warm."

Evenings devoted to pop corn, candy pulls, blind man's bluff and frolics are evenings of profit too, for joy is an assett in any home, and care free childhood with its cravings for mirth and affection fully met, makes an entry which in the end never appears on the wrong side of life's ledger.

I have known homes where the burden of debts pressed upon the hearts of all,—often exagerated,—where, unconsciously the hard times talk of the elders prevailed to the extent that the sensitive growing children shared in the depression, and felt crushed by a burden they scarcely understood. To bring unnecessary gloom, whatever the cause, into the home life, is robbing our best loved of their birth right. I have known homes, too, when the meeting around the family board was an ordeal rather than a pleasure. Where "gluminess" prevailed, and where a natural laugh or remark from a child would meet with a scowl or repression. Deliver us from this phase of family life. Dyspepsia waits on such, and the children flee from such an atmosphere at the earliest opportunity.

More and more as the world grows older and wiser, we learn that it is by the keeping of heart and mind and energies, enthusiastically and happily employed along the lines that are worth while, we shut out the appetite and the inclination for the unworthy and undesirable. Homes where the conversation tends to right thinking, to the love of nature and the observing of her work, to helpfullness and kindness, and to noble ideals wil not be hot-beds of gossip, of unkind thought, of coursness and vulgarity.

After all, whatever the eccessories for improvement, or along whatever lines social development is carried on, whether it is the old-fashioned neighborly gatherings for fun, frolic and visiting, or the more cultured efforts of the lyceum, the magazine club or the reading circle, all good, if entered into heartily, and we come back in the end to the conclusion that the best thing we cando with home life is just to make it "homey."

It seems to me I cannot close this paper better than with lines from that exquisite picture of the real home spirit in Burns' simple but immortal poem:

THE COTTER'S SATURDAY NIGHT.

"With joy unfeign'd, brothers and sisters meet,
An' each for other's welfare kindly spires:
The social hours, swift-wing'd, unotic'd, fleet,
Each tells the unco's that he sees or hears"
Then later follows:
"The cheerfu' supper done, wi' serious face,
They round the ingle, for a circle wide;"
And after the loving partential counsels
"The Sire turns o'er, with patriarchal grace,
The big ha'-Bible, ance his father's pride;"

"Then kneeling down" prays that
"That thus they all shall meet in future days;"
"In such society, yet still more dear:
While circling time moves round in an eternal Sphere."
"From scenes like this, old Scotia's grandeur springs,
That makers her lov'd at home, rever'd abroad:
Princes and lords are but the breath of kings,
"An honest man's the noblest work of God";

POTATO CULTURE.

SOIL PREPARATION, CULTIVATION, PROPAGATION AND CARE.

G. W. DODDER, BEFORE THE WASHINGTON COUNTY FARMERS' INSTITUTE.

The potato is a native of South America. It has long been known as the "Irish Potato," because of its general use in Ireland. It has proved one of the greatest blessings bestowed on man by the Creator. It is next to the staff of life, bread. The potato is grown in every state and territory in the United States.

The ideal soil for the potato should be one so light as to offer no great resistance to the enlargement of the tubers, and so supplied with organic matter, and to be rather moist without being too wet, and so rich as to furnish an unfailing supply of fertilizing ingredients. A rich, sandy loam, abundantly supplied with organic matter, and naturally well-drained, is preferable. More solid soils may be rendered suitable for the potato by draining and by the incorporation of barnyard manure, or, better, plowing under clover and other green crops. Very heavy soils should be avoided. Recently cleared wood land suits the potato, or a sandy soil if it be not subject to drouth; this kind of land may be fitted by the addition of organic-matter.

Potatoes grown on light clay, or sandy land, are of a finer grain and of a much better flavor than those grown on heavier, black soils.

The success of the potato is largely dependent on the crops preceding it in rotation. If clover or other leguminous plants are grown just preceding potatoes the straw or stubble furnishes organic matter and to the store of ——.... available nitrogen in the soil. Corn after sod frequently precedes potatoes. I find this generally a good rotation. Two years, or three at most, is as long as a field should be devoted to continuous potato culture, though this crop is frequently grown longer on the same land, which naturally taxes heavily the fertility of the soil, and necessitates liberal manuring, as well as involving considerable risk of injury from funges diseases, and especially from the potato scab.

A clean crop of potatoes can not, as a rule, be grown in land which the preceding year produced scaby tubers. The germs of the diseases once in the soil must be starved out by growing on the infected field other crops, such as grass or grain, for several years. Three or four years rotation gives very satisfactory results. Land seeded to clover in spring and the second year clover plowed under in the fall and third year potatoes, has proved successful.

To give detailed directions for the preparation of one kind of soil would not apply to others.

Hence it can only be said that preparation should be deep and thorough. Plowing can scarcey be too deep, provided that much of the subsoil is not brought to the surface. When practicable, the depth should be gradually increased from year to year. Though the tubers are usually cultivated from three to five inches of the surface, the roots feed much deeper, penetrating the soil from twelve to twenty-four inches, or more. Expreience teaches as to extent of the distribution of potato roots in the soil and we desire to emphasize the importance of deep and thorough preparation of the soil for this crop.

MANURING.

The potato requires a liberal manuring, barn yard manure usually affording a large increase in the crop, for not only does it supply nitrogen, phosphoric acid and potash, but it improves the conditions of the soil. However its direct application to the potato affords conditions favorable to potato diseases, and an injury to their quality.

For this reason it is best to apply barn yard manure to corn or grass the year before potatoes are grown. If it is considered necessary to apply it directly to the potato ground, it should first be well rotted.

VARIETIES.

The farmer should be his own judge as to varieties, aiming to plant only those that do the best on the kind of soil in which they are to be planted. Some varieties do well on one kind of soil and are almost worthless on other kinds.

TIME FOR PLANTING.

Each community is the best judge of the time for planting. The aim should be to plow the soil as soon as it will crumble nicely, but you should by no means ploy it when it is wet, for if you do you may expect a failure. Be sure and get your soil in a loose and fine condition, and always bear in mind, a crop well put in is half tended. Then, plant as soon as the weather seems favorable, without subjecting the young plants to severe cold. Planting should be done at such a time or date, as to bring the stage of growth, during which the tubers are rapidly developing, at a time when there is ordinarily an adequate supply of moisture, in order that the tubers may have the moisture that they may fully develop.

DEPTH OF PLANTING.

The roots of a young potato plant does not grow directly from the seed piece, but from the under ground joints or nodes of the stem. From these underground nodes also grow the short stems which bear the tubers at their extremities. Hence, the seed pieces should be planted deep enough in the soil to permit several of those joints to form below the surface, so as to afford room for an ample supply of roots and tuber bearing stems to grow. Very deep planting is open to objections because of the increased labor of harvesting. Very shallow planting reduces the yield and injures the quality of the crop.

CHANGE OF SEED.

Experience teaches that it is very beneficial to change seed potatoes to different kinds of soil every few years. To make this change, tubers of some desired strain may be sent to a careful, practical potato grower some distance from a locality, where there is different kind of soil, and after two or three years' culture under new conditions the seed may be brought back to its original home, very much improved in quality and apeparance. The color of the surface of the potato resembling the variety of soil it was raised on.

SELECTING THE SEED.

The size of the seed tubers selected is a matter of very great importance. By selecting the largest, best and smoothest tubers from the hills in which the vines are most vigorous and yield the largest number of smooth and well-developed tubers, we invariably obtain the best results.

SMALL POTATOES.

Small potatoes for seed is an important question, on which many potato growers are divided. Some present the plausible argument that the use of under-sized potatoes result in degeneration. It may be said that the planting of small potatoes year after year will result in degeneration.

CUTTING THE SEED PIECES.

Most potato growers who raise potatoes for the early market use large cuttings, two and three eyes to the piece. It is important that the seed pieces be large enough to furnish abundant nutriment to the shoots which spring from it, and, what is more important, large pieces improve the chances of getting a good stand in an unfavorable season, because they have less exposed surface than small pieces, hence are less liable to dry out excessively when drought follows planting. They are also better able to resist rotting if wet weather prevails.

When cutting the potatoes the operator should begin at the stem end and the pieces should be cut in a compact shape, and of as nearly equal size as is practicable. Follow the same rule if cutting one ,two or more eyes to the piece. When finishing up at the seed end if the potato is of medium size or large the seed end should be cut in two, three or more pieces according to size of potato and this last cutting should be made from the seed end down. The seed end cuttings may be kept separate if desirable, and not planted with the other cuttings. In this connection it may be said that the seed end half gives an earlier crop than the stem end, this suggesting the expediency of cutting a potato lenghtwise when halves or quarters are to be planted, thus securing on each piece one or more of the eyes which germinate first. Another advantage of cutting lengthwise is that it insures a more even distribution of the eyes on the several pieces.

A SINGLE EYE.

A single eye may give rise to severed stocks, for each eye is a compound bud or cluster of buds. An eye can be bisected and each half or part may then grow successfully if it is not a victim to dryness or decay to which its exposed condition subjects it.

EFFECTS OF SPROUTING.

The growth of sprouts before planting is made at the expence of the tubers from which they draw their support, hence if these shoots or sprouts are rubbed off before planting there is a total loss of the nutriment contained in them, moreover numerous weak shoots grow from the injured eye. To prevent the evil consequences of premature sprouting seed potatoes should be stored in as dark, dry and cool place as practicable. Only potatoes that have not sprouted should be selected for planting.

PLANTING.

After the soil is plowed and well pulverized, and a good seed bed formed, the rows should be laid off as close together as practicable, without interfering with horse cultivation. Much care should be taken that the furrows be run straight and of as even a depth as possible, and the seed pieces dropped twelve to eighteen inches apart. The distance depends on the variety, the season, the condition of the soil and so forth. Varieties with strong growth of vines or which set many tubers in a hill should have greater distance between plants than is necessary with less vigorous varieties.

The seed pieces should not be covered more than two or three inches at first; this will give the sun a chance to warm the soil and start the germ much sooner. Then in about eight or ten days work more soil in the furrows, this will give them a cultivation and kill all weed seed that have germinated. This may be done with a harrow by harrowing first lenghtwise of the row, which will pulverize the soil nicely, then harrow crosswise of the row, this leaving the ground in fine shape for plowing the young plants.

NEW VARIETIES AND HOW PROPAGATED FROM THE SEED BALLS.

In a state of nautre most species of plants depend mainly upon seeds for the production of their kind. As seeds are the main dependence of plants in nature so are they man's chief reliance in agriculture.

The seeds from the potato balls form at the tops of the plant where the blossoms were, and resemble a cluster of small green tomatoes. When the balls have matured the seeds are taken out and saved, as you would a tomato seed. In the spring about the first of May they are planted in drills in the open ground in good rich soil. The depth of planting the seed should not be more than one inch. Scatter the seed evenly in the drill, but not too thick, and cover with fine loose soil, pressing down firmly, then place a stake down at each end of the drill or trench; then nail on top of stakes a six inch board in order to keep a crust from forming after a rain, for if it does the plants will never get through the crust, and will perish. As soon as the plants are two or three inches high they are lifted with a knife and transplanted as you would a tomato plant, in hills about twenty-four inches apart in the row in good rich soil. As soon as the plants get nicely started they may be cultivated with a table fork, by taking the small plant between the thumb and two front fingers close down, and then with the fork begin about six inches back from the plant, and loosen the soil nicely up to the plants. You must be very careful that you do not loosen the plants, as they are rooted very shallow. Cultivate once a week to keep the weeds down, and form a fine dust mulch. As the plants grow larger you can use a larger tool for cultivating. When the small tubers are matured in the fall get as many small berry boxes as you have hills to dig. Number the boxes from one up to as many hills as you have to dig. You should have a book that you may keep a record of each hill as you dig them. When you dig the first hill place the tubers in the berry box marked number one, then record the same number in your book to correspond with the number on the box, at the same time note the vine-growth, yield and how they grew in the hill, if in a cluster or scattered, and so forth. In the spring as soon as the ground is dry and warm enough prepare your ground in good shape. You can scarcely have it too loose and mellow, then mark off your ground and plant your small tubers one in each hill, and cover them about two inches deep with fine loose soil. When box number one is planted then place down a stake, then plant number two and so on until they are all planted, and when you dig them in the fall note the vine-growth, yield and so forth, and make a record of each hill as before in your book for that purpose. The next spring plant as before. The third year they will be developed then you will know the vine-growth, yield, keeping and cooking qualities. It requires three years to develop the tubers from the seed balls. Now understand that each and every seed taken from the seed balls produce a different variety of potatoes and by this you will see it requires much care and patience; then after all this care we scarcely get five per cent that is worthy of name.

CULTIVATION.

Experience and exact experimenting generally favor flat culture, or nearly so. Excessive hilling during cultivating intensifies the injurious effects of dry weather, it results also in breaking many of the feeding roots between the rows which is very injurious to the plants and yield of tubers. It is very beneficial that the crust be broken that has formed after a rain for the benefit of plant growth, it will also kill all weed seed that have germinated and also form a fine dust mulch, if it should happen to be dry. This work may be done with a light one-horse harrow by going twice in a row, but not too close to the plants.

THE POTATO SCAB.

The potato scab is one of the most widespread diseases affecting the potato. It is well known that this is a parasitic fungus which lives upon the potato, causing a roughened appearance. Sometimes it may involve the greater part of the potato. Occasionally only a small part of it. This rough or scaby appearance affects the sale of the potato very much as they are not desirable for table use. The scab may be successfully controlled by treating the seed, previous to planting, with a solution of Corrocive Sublimate. To prepare the solution, first, dissolve two and one-half ounces of corrosive sublimate in two gallons of hot water, and then in twelve hours dilute with clear water, so that the whole quantity makes fifteen gallons. Put this solution in a good barrel and you should have a good coarse sack in order to immerse them in the solution. If your potatoes are dirty, they should be washed in order that the solution may have the desired effect. You may cut the potatoes before or after immersing as you wish. You can put one bushel at a time in the sack to immerse them. You should not leave them in the solution longer than one hour and a half, then lift them out of the barrel and lay two sticks across the top of the barrel and place the sack on the sticks to drain. When done dripping empty them out on boards to dry. As soon as dry they are ready to plant, if cut. Corrosive Sublimate is a poison and must not be placed where it can fall into the hands of children. If any seed is left after planting they should be buried in order that they may do no harm.

POSSIBILITIES OF DAIRYING ON THE FARM.

MRS. D. J. COWDEN, BEFORE ADAIR COUNTY FARMERS' INSTITUTE.

A dairy is where milk is kept and converted into butter and cheese. In this day and age of progress this is an impossibility and very unprofitable to the farmer. Why? Because the average farmer does not have the time, place or machinery for making either butter or cheese; and if he had, could not command the price our creameries do, where they have every advantage and all the improved equipments and can handle all the cream for miles around the creamery.

1st. To get milk we must have cows. When I first started to have anything to do with the cow,—twenty-five years ago,—we would milk from six to eight or ten cows in the summer only, and do without milk or butter in the winter. After milking we would carry the milk to the cave, (few had cellars) strain it in gallon crocks, 'let it stand from twenty-four to forty-eight hours, then skim, empty the crocks into buckets, generally tobacco or candy buckets, which held about five gallons, carry up steps and to the hogs.

Why but that was a back breaking way, and this was generally done by the farmers wife. Then the cream had to be churned, and that meant every day, too. The butter must be worked over twice then packed in jars and taken to town and traded out; and I have got as low as six cents per pound for it; and I thought I was doing wonderful things, buying the groceries and trying to keep out of debt. But the groceries were few and far between, and luxuries never.

The cows had no care,—run on the prairie on feed range, in winter seldom had any shelter unless it was a straw stack, and in spring would be walking skeletons hardly thick enough to cast a shadow. And it took some time to flesh up, and it would be the last of May before you would get much milk. Then along came the flies, as thick as only can get flies and these pests deprived the farmer of one one-third of their milk, and so poor care mixed with flies didn't bring in many shillings.

The first step away from the churns was cream gathering, that was when a man came around and gathered the cream. The milk was kept in large tin cans with a strip of glass in one side with inches marked and these cans were kept in a large trough filled with water. This cream was sold by the inch, but the same Company never run two summers in succession, and always broke up, owing the farmers for the last months cream.. This didn't pay the farmer, but it might have helped the creamery Company at the expense of their good name. The second step was selling your milk to the creamery or skimming station, hiring all the milk hauled to the station and separated there, and then hauled back,—but it was never fit to feed to calves. Every one has his own ideas, but mine are that this milk hauling is what killed off all the cheap horses and helps account for the present high price of horses. When horse flesh came up, milk haulers went out, except the ones that had a receipt for absorbing milk from their patrons cans into their own can by the time they reached the creamery. And this didn't pay the farmer either, but it surely did add to the haulers income.

Now the farmer had his choice of doing the impossible thing of hauling his own milk or paying twenty-five dollars for a twenty-five dollar hand separator.

The farmer chose the lesser of the two evils and bought the separator and now nine out of every ten has his herd of from eight to twenty ,or even more cows; his cow barn, his sprayer to kill the flies, so that he can milk in peace, and the hand separator, and has gone into the money making business for himself.

It only takes about one half hour to separate the milk, feed the valves and carry what is left to the hogs, (which converts all the waste of dairying into golden eagles, and the milk has never been down cellar once. Of course the separator will have to be washed, and during the summer the separator house will have to be scrubbed once a day but this is not one-half so hard on the farmer's wife as the old way. I know, for I have tried both. By the old way I had plenty of hard work and no pay; and now I have some work and plenty of money in my pocket book—and so have all the farmer's wives who have separators. Some of my neighbors have made as high as eight dollars a month per cow, and from the Adair creamery too. This is an exceptional case, but true, never the less.

Under the present system a good cow will bring $50.00 profit each year. This includes the calf, the cream, and the milk for hogs, to say nothing of milk and butter for house use.

It is possible to keep four or five cows for every member of the farmers family over twelve years of age, and run fewer risks of being maimed for life as their city cousins will in one game of foot-ball.

Twenty cows well-milked and well taken care of means an income of $1000.00 to the farmer each year. One half this number will clothe and buy all the groceries needed by any one family and keep them from running a store bill.

Before the day of the hand separator it took all that hundreds of farmers raised to pay their store bill. Now the cows keep the family, leaving what the farmer raises to pay the mortgage, make improvements and add to his farm.

It requires no more brains to milk cows than to farm for grains. Brains are not needed one-half as much as a closer use of the ones we already possess.

The cows will make you more money in less time and let you work in the cooler part of the day, than simply farming for grain, but to make a successful farmer and keep the land enriched you will have to do both. True, milking must be dene when the time comes. It is work that is binding and keeps one at close at home but in the end it pays.

THE FUTURE.

I am not much of a profit, neither can I see far into a grindstone, but I can say after the old cow has eaten it "I told you so."

Now we are going to stop where we are? or, are we going to make improvements we have in the last twenty years? If so, it won't be long until we can buy any of the standard cream separators for $35.00; milking by machinery, separating with a gasoline engine and sending the cream to the creameries in an electric car. But whether we milk by machinery or not I believe a breed of cattle will be developed in the next twenty years that will bring in one half more income than they now do.

It is now the work of the farmer to develop this breed, by testing each cows milk and selling all that do not come up to a certain standard. The sooner they commence the sooner we will get the breed. Then the farmer will have done his share. It will then be the inventors work to give us the milking machine.

By this time I hope the farmers wife will have developed so that she can spend the extra cash without much effort. But I don't think she will have half as much to show the money at the end of the year if she receives pay every time cream is sent to town, because the amount is too small to do any real shopping, and is very liable to go for something that amounts to nothing, where as if she receives her pay every two weeks she will plan to get what she needs and lay by some for a rainy day.

DAIRYING.

A. J. BARNHART, BEFORE BUCHANAN COUNTY FARMERS' INSTITUTE.

"Mr. Chairman, Ladies and Gentlemen:

"Your president, Mr. Warburton, has asked me to write something of my experience in the dairy business, with the thought that perhaps some points may be brought out that will be helpful to those interested in that line of farm work.

"Thirty-eight years ago I came to this state and county, bought a farm and stocked it with twenty cows for the purpose of dairying, cheese making for the summer product, and butter for spring, fall and winter.

"The cows were that is now termed 'general purpose' cow, that is a cow with a large frame capable of putting on flesh so that she will sell for enough money to purchase another one in her place when she has become unless as a milker.

"This was the kind of cow I bought. We aimed to have her freshen in the spring on grass. We then knew nothing of a balanced ration, grass being the best known. Having that for about seven months, during the other five we fed hay and gave them the run of a stock field and a few nubbins of corn to keep up flesh. With this cow and feed eight months was about the limit of the milk product—the next four being dry.

"After an experience of four years I sold out and came to town—to buy butter instead of make it.

"I bought and shipped the product of the cow keeper in this vicinity for thirteen years . I learned that there was very little profit for the farmer as cows were then kept. Except for the calves and hogs it would have been uphill business, but as milk was necessary for both it paid to keep them to a certain extent. We first bought salted butter and reworked it, then the unsalted and reworked that. In the main the salted butter was of an inferior quality, caused by variety of flavor, color and texture. To secure greater uniformity we adopted the system of buying the butter unsalted from the churn in its granular form, thus enabling us by salting, coloring and working to produce good grade butter. Still the market demanded something better. This led us into the creamery business and the gathering of sweet cream from the farmers, which we took, ripened, churned and packed into tubs. Under this system we took a cow census twice a year and found that on an average the cow yielded less than one-third of a pound a day during the grass or milking season. Notwithstanding these conditions the business grew to a car load of butter a week during the months of May, June, July, August and September, showing that an even a discouraging profit people still kept their cows. Always interested in the dairying I bought another farm, stocked it with Jersey and Guernsey cows and built a silo. At that time the silo was rather a new thing, and did not prove to be the success I had expected. We cut our corn too green. Our ensilage was sour, but the cows ate it fairly well. The silo was not built tight enough to exclude the air, which spoiled more or less of the ensilage. However, we were on the right road. We had the right quality of cows and used a good deal of bran with the ensilage. The result was entirely satisfactory at that time .

"When I retired from business I sold that farm and the cows, but had left on my hands 160 acres of very wet, practically unsalable land. I made up my mind I could make a dairy farm of it. I put in 1, 600 rods of tile and put up some buildings. We bought ten high grade shorthorn cows and a Hereford male with the idea of combining stock raising with dairying, beef being high and dairy products low, while my tenant was an excellent stockman and knew little of the dairy. At this time our feeding of the cows was not productive of the best results for milk. The first year the butter product per cow was $24, and after deducting the cost of maintenance, which would be fully $20, the profit was very small. The next year we fed more bran and the results were better—$26 per cow. The following two years we increased our herd to sixteen cows and the product was $36 per cow, the result, we believve, of feeding more clover hay with bran and oil meal. In 1904, with the same cows, the average was $40 a head, due to the better care and a more perfect ration. In 1905 my books show an increase of $17 per cow over the year before, or $57 each.

"In the spring of 1903 I sowed 2 acres of alfalfa. It came up and did well during the early summer, but died out in the latter part of the season. Undeterred by this failure, last spring I produced from the government agricultural department at Washington bacteria to inoculate the soil to cause the proper nodule to grow on the root of alfalfa. The result was good. We cut 3 tons from that 2 acres last year. The first of the year we fed a good deal of bran and oil meal, our cow hay was about half clover and the alfalfa was fed at the latter part of the season. All this was good material for milk production. I also built a silo, filled it, and from early fall up to the first of January—that being the end of my cow year—we fed each cow about 30 pounds a day.

"The cows we milked in 1905 were eleven grade shorthorns, one 10-year-old Guernsey, two 3-year Guernseys with second calf, and for three months three 2-year-old Guernseys with first calves, making the value of fifteen cows for the year. I am forced to conclude that the greater part of the increase has been caused by feed and care, because practically eleven of these cows are the same as milked in previous years, and the price of butter has not changed to any degree. I think it will pay the painstaking dairy farmer to keep only the dairy bred cow, feeding and caring for her for the milk she will produce. In 1904 I bought in Wisconsin sixteen head of Guernsey heifers one year old, and of W. D. Hoard, of the Dairyman, a bull. He said in correspondence that he had fifty Guernsey cows and that their milk had netted him $75 each. Of course his feed and care are of the best. He had 25 acres of alfalfa, which is nearly equal to bran for feed. The expense of commercial feeds is greatly diminished when we can have alfalfa or even clover. We purpose to test each cow, weighing her milk and using a Babcock tester, and turn out any cow that does not come up to our standard, which we have fixed for 1906 at 300 pounds per cow. We will have in our herd eleven heifers with their first calves and it will not surprise me if we do not reach it.

"I am aware that few farmers care to keep the regular dairy cow. They prefer the big calves and steers, but there is one thing they can do, and that is—learn to feed the big cow for better results. The common cow usually gives a large flow of milk when she freshens, and holds it for a while, then she shrinks until at eight or nine months she is dry. Now when a cow freshens she should not be allowed to shrink, but at any indication of it increase her feed. The cow, when she once looses her flow, cannot be brought to the same quantity again. That means a loss at each time during her milking period. My tenant and I agree that the great difference of $17 gain to each cow during the last year is mainly due to a close observance of this rule. Care should be taken that the cows do not stand out in the cold either day or night, or in a cold rain. Anything that excites a cow, such as being chased by boys, or an unusual commotion in the stable, causes a decrease of the flow of milk.

The disease of tuberculosis is causing a good deal of uneasiness in some parts of the country. The packers are condemning large members of hogs to the rendering tank. There has been talk of discriminating against hogs for the dairy districts because of the feeding of milk from diseased cows. We have thought best to have our cows tested with tuberculine, so called by the veterinarian, Dr. Kippen, and he has tested our Guernseys, eighteen in number. We think that with a clean record and our new sanitary cow barn, we can keep free from the dread disease.

This barn we rebuilt last season with the idea of the health and comfort of the cows. We put ina cement floor and sealed with shiplap the sides and overhead. Put in eight large windows an air shaft—took 2x12 for studds 4 feet apart and continued the 2x12 rafters to the ridge. Papered and sealed over the paper with boards, and there joined in a cupola 4 feet high. The air shaft is open at the bottom on the inside 1x4 feet, then on the outside of the barn a slot 3x12 inches is cut just above the sill every 6 feet to let the air in from outside. Corresponding with these slots on the inside are a like number of the same sized slots close to the ceiling, to admit the outer air. This is the King system of ventilation. Each cow has a separate stall floored with plank, facing the ventilators and is fastened by a rope behind. I have not been in the barn this winter, but Mr. Cox, my partner, tells me that after being closed all night with more than twenty cows that there is no odor, so thorough is the ventilation.

"Cleanliness is an object from start to finish. The machine milker is almost here, and with that no dirt or offensive bacteria can get into the closed receptacle. When one person can, by tending two machines, milk 30 cows in an hour dairying will be much easier than it is at present. Here is a summary of the butter product of our cows during 1905:

"Fifteen cows, 4,700 pounds butter; average price, 21 cents; money received, $858.00; pounds per cow, 272; money per cow, $57.20.

"The average cow of this state yields 150 pounds, in Pennsylvania the average is 140 pounds, while ex-Governor Hoard's dairy yielded him 350 pounds per cow, and there is an individual Wisconsin Guernsey Yeska-Sunbeam on record that recently produced over 1,000 pounds of butter in one year.

"What do we learn from these figures?"

Mr. Barnhart was tendered a vote of thanks for his paper.

In the discussion the following suggestions were brought out:

To keep the cow from shrinking you must feed from first signs of shrinkage. Do not feed to the extent of harming the cow. There is no reason why a general purpose cow would not increase the same as the Guernsey. The idea for the farmer to grasp is to make more use of the cow than you have. To raise fourteen calves would require milk equal to the milk of one cow for one year.

THE LIFE LIMIT OF SEEDS.

FROM BREEDERS' GAZETTE.

How long does a seed remain alive?

"Well," said a well-known seedsman to whom the question was put, "it all depends upon the seed. I have known melon seeds to germinate after 30 years, while parsnip seeds are practically dead at the end of one year."

The question of the length of time which elapses before a seed loses its power to germinate and reproduce its species is receiving considerable attention from modern gardeners who understand their business thoroughly. These men have learned that the age of the seeds has a decided influence upon the crop. The ordinary amateur gardener and the average farmer demand new seeds, regardless of the variety which they are purchasing. The expert on the contrary will not accept certain kinds of seeds unless they are several years old. He has found, for instance, that he gets better results when he uses cucumbers seeds that are three years old than if he plants those whose age is but a twelvemonth. The latter seeds will result in a greater growth of vine but less fruit. The older seeds will give vines with a smaller amount of vitality, but the fruit will begin to form much earlier. Sometimes this matter of age will mean a difference of two or three weeks in the time of cropping, so that the man who knows this little secret is able to get his cucumbers on the market several days ahead of his neighbor who planted new seeds.

This does not hold good with all vegetables, however, for it is imperative that seeds not more than 10 or 12 months old be planted for some of the root crops like parsnips, otherwise there will be no crop. It is said that as a rule the smaller seeds are hardier than the larger ones. The tiny celery seed will germinate after 10 or 12 years, while corn is good for only about two years.

The germinating power of a seed depends a good deal upon the latitude in which it is found. In Eastern Massachusetts a buttercup seed naturally germinates in a few weeks, but it requires two full years or nearly that for the seeds of the Greenland buttercup to germinate. The difference is due to the flinty covering of the seed. If a part of this covering be scraped off the seed will manifest its seed life much sooner.

Naturally as great variation exists among flower seeds as among vegetable seeds. The larkspur seed must go into the ground within a year, but the balsam will germinate at the end of 10 years. An expert flower grower, who lived in one of the suburbs of Boston, a few years ago was noted for the wonderful double blossoms which he annually produced. After a time the secret of his success was disclosed. It was the simple one of planting only seeds which were several years old. By this method he secured flowers which were 80 per cent double, while year-old seeds planted by other growers did not afford blossoms more than 50 per cent double.

Sweetpea seeds a year old seldom contain more than 80 per cent of live germs, and after they have been kept for two years they are of little value. A paragraph has gone the rounds of the papers at intervals for several years to the effect that sweetpea plants have been grown in England from seeds found in mummy cases taken from Egyptian pyramids. This statement undoubtedly was made in good faith at first, as several prominent scientists were deceived by a clever imposition. It seems that the seeds actually were found in the mummy case and it was assumed that they had been there as long as the mummified body itself, 2,000 years or more. After a time, however, it developed that some designing person had found a way of getting the seeds inside the mummy cases after the tombs in the pyramids had been opened. Some of the seeds were planted at Harvard college and developed plants which were the exact counterpart of those found all along the shores of the Mediterranean Sea at the present time. So much for the mummy pea myth. As a matter of fact, sweetpeas are a comparatively new plant, having been known for only about 50 years as far as there is any record, although it is possible of course that the ancient Egyptians may have grown them in their gardens.

Suffolk Co., Mass. THE ELMS.

HOW TO GROW CELERY.

H. M. RANDEL IN WESTERN FRUIT GROWER.

Either grow your own seedlings or buy plants to set. Work the ground fine to a depth of at least a foot a couple of times before plants are ready to set. Make an extra fine seed bed for two rows of celery. Mark off two rows ten inches apart. The best way to do that is with your feet; push them along in the dirt to a depth of two inches, allowing your weight to compast the soil under the plants. Set plants ten inches apart in each row. Work fine dirt with your fingers among the roots, leaving bed level when set. This puts the roots in the warm sunshine to grow. Do not dig a ditch to set plants in; they will not grow fast in the deep, cold ground. Next get a mulch three inches thick, compacted tightly, between the two rows. This may be a mixture of manure and straw. Leave this mulch during the season to hold dampness and to water the plants in if the season is very dry. It also saves half the cultivation and makes the plants grow vigorously. Do all the cultivation on the outside of each row. Planted in this way two rows are grown as easily as one. Simply cultivate as you would a cabbage plant till knee-high before banking up. To hill up sooner retards growth. Or a few plants may be tiled or banked up for early use sooner than this .

To prepare celery for hilling, tie binder twine around each plant to keep out dirt and air from center. It will bleach better and handle better. In banking lean tops of each row together and both rows are banked as easily as one. Bank within six inches of the top. Make bank higher each week as celery may grow until danger of freezing. Then remove to cellar. Do this in this way: First dig down bank on outside of each row, then with a potato fork lift out each bunch, retaining as much good mellow dirt as possible. Remove to cellar carefully. If a very dry time, pour some water around each plant before lifting out and dirt will stick better to roots.

Bank in the cellar as follows: Use no box, but set first bunch in the corner of the cellar against the cellar wall on the cellar floor. Press the roots of each bunch as close together as possible, filling in fine mellow dirt taken from the ridge at least two-thirds the height of the bunches. This dirt must be watered to dampen it thoroughly about every two weeks. Do not wet the tops when watering, as it will cause the celery to rot. Use a large funnel to conduct water. Make the dirt wet, not muddy. Pour the water principally by the wall. Treated in this way each bunch will bleach white and force a growth in the center of each of the most crisp and delicious quality. It will be the voice of all who eat, "I never ate such before". Be sure to keep it moist, be sure to keep it from freezing, and you will be sure of success.

LOCATION OF TILE DRAINS.

W. H. STEVENSON, SOIL SPECIALIST, IOWA AGRICULTURAL COLLEGE.

Within the past few months, thousands of corn-belt farmers have determined to drain their farms or at least portions of them. Many of these land owners have had comparatively little experience in the actual work of tile draining and hence there is lively interest at present in the subject of the location of tile drains.

The factor of chief importance is an adequate outlet for the drainage system which it is proposed to construct. The outlet may be a natural stream of an open ditch, but it must be large enough and so situated that ample provision will be afforded for the removal of the water discharged by the drains.

The farmer should then determine how thoroughly he proposes to drain his land and should locate the drains with reference to the natural wetness of the land. In this relation he should determine about how much water comes to his tract from the surface of the higher land near by or from the seepage from slopes.

If portions of the tract to be drained are as dry by reason of natural drainage, as it is planned to make the other portions the dry areas should be passed by and the drains should be located in such numbers in the wetter areas as will assure a uniform degree of dryness throughout. In this connection it is well to note that in many instances the land which is thought to have sufficient natural drainage is really not well drained when compared with that which has been thoroughly tiled. When land is worth as much per acre as it is at the present time, the most thorough drainage is in the line of economy.

The main lines should be located in the course of natural surface flow. However, due care should be exercised to straighten the line of natural drainage by short cuts here and there whenever this can be done without impairing the efficiency of the drain. This work often materially lessens the cost of construction and a line of tile laid in straight courses joined by curves is always to be preferred to one which follows all of the curves and crooks found in natural depressions. The following disadvantages attend a crooked line: The tile are laid less perfectly and with greater difficulty; there is added friction of the running water against the walls of the drain; a greater number of tile are required to accomplish the same purpose and there is a loss of grade.

It frequently is true, also, that there are swampy areas and sloughs in the tract which can be reached with a main drain more economically along some cut-off than along the line of natural overflow. But the principle holds that efficiency and economy in construction are based upon locating drains along the lines of natural drainage.

The laterals should be placed up and down the slope. This rule applies not only to hillsides which require drainage, but also to flat land which has but a slight slope. A goodly number of land owners advocate placing lateral drains across a slope. This plan is favored on the ground that the water coming from the soil above is intercepted by the tile drain and is thus prevented from rendering the soil below the drain wet and unproductive. "Practice has proven this to be a mistake," says C. G. Elliot, the eminent drainage authority. He says in addition, "Lines for conveying the drainage-water may be located at right angles to the slopes if placed so far down on the bottom land that the grade of the drain is greater than the slope of the surface at the side. Water oozes through the soil along the line of steepest descent, at all times seeking a lower place where it can be at rest. If a drain is placed across his course of soil water, the descent of the soil channels being greater than that of the drain, water will flow out of the joints of the drain and continue to ooze through the soil, only a small part being conveyed away by the drain.

It is well to note the following exceptions to the rule that drains should be laid up and down the slope. When a pond or swamp is surrounded by steep slopes which have a porous subsoil the water tends to flow through this porous stratum to the base of the slope and accumulate there, thus forming an exceedingly wet area around the border of the pond or swamp. Because of the fact the soil of the wet area bordering the pond is less previous to water than the subsoil of the slopes, it is kept constantly saturated and a line located in the center of the pond does not adequately drain this wet border. In such a case the remedy is found in an intercepting drain laid near the base of the slope.

Again, there are extensive swampy areas which receive a constant supply of seepage water from steep side slopes. This water should be intercepted by drains at the upper edge of the saturated strip.

Wherever it is possible, long, parallel laterals should be used. This is chiefly in the interests of economy. Lands is doubtly drained whereever one drain joins another as in the case of a lateral making a junction with a main or submain. There are instances where the lay of the land is such that short laterals are necessary.

There is another point in regard to locating drains which is worthy of emphasis. On level areas where the grade is necessarily light, great care should be exercised not to overcharge mains. This mistake is easily made when there is a large area to be drained and the grades are light for both mains and laterals.

In board, flat sloughs it is often advisible to use two lines of tile instead of one large main through the center. When this is done the collecting drain should be located near the base of the slope. The advantage is this: By this arrangement it is not necessary to carry laterals down the slopes and for some distance through a flat bottom which would tend to seriously retard the flow of water. Engineers agree, however, that unless the slope toward the middle of the slough is decidedly slight, the best results and reduction in cost of construction are secured by one center main of sufficient capacity.

Generally it is not advisable to install a drain in the lowest part of a draw. In time of heavy rainfall the drain thus located is likely to be injured if not washed out by the torrent of surface water. The better plan is to locate the drain at one side of the lowest point in the draw and to construct a wide, shallow ditch parallel with the drain. This ditch will carry off all the surface water which cannot be handled by the drain in time of flood. Such a ditch may be seeded to grass or may be cultivated without serious inconvenience.

GROUND YOUR WIRE FENCES.

WALLACES' FARMER.

Nearly all the losses in live stock killed by lightning in the western states during the year are due to the fact that farmers have not all learned how to ground their wire fences. Perhaps this is not the best way to put it. We should rather say, having learned how to ground wire fences they have not put that knowledge into practice, and knowledge not put into practice is a good deal like dead stock on the merchant's counter or the farmer's capital invested in non-productive property. Farmers do not need so much to be told what do to as to be stirred up to do it.

Nearly every farmer understands the first principles, the elementary laws governing the movements of lightning. He understands that steel wire is a good conductor, that the fence post is a poor conductor, and that when lightning strikes the fence at any point it runs along the wire in preference to passing over the post into the earth. He understands, therefore, that if cattle are bunched into the corner, as they are very likely to be during a storm, if lightning should strike the fence all the animals that are in touch with the wire fence are quite certain to be killed, as the body of the animal is a better conductor than the post and the lightning simply takes that as the shortest way of getting back to the earth, where it is trying to go. They are also aware, or at least should be, that barbed wire is in itself pretty good lightning rod, the barbs serving the same purpose as the points at the end of the wire on the building. Therefore, all that is necessary to change a wire fence from a source of risk and loss to a farm lightning rod is simply to ground the wires.

What do we mean by grounding wires? Nothing more or less than taking a piece of smooth wire, pushing it down into the ground until it reaches moist earth, then forming close metallic connection with each wire on the fence. This may be done in one of two ways; either by wrapping it around each wire or around the lower wire only in case of a woven wire fence, or by stapling it tightly to the fence post so as to bring it into close metallic connection with each barbed or smooth wire of the fence. This can be done by driving a staple over both wires and thus bringing them into close metallic connection. This need not be done with every post but say with every fifth or sixth post, and in this way the danger of loss of life stock from lightning is partially removed. The wire fence against which cattle are likely to congregate then becomes the safest place in the field during the time of a thunder storm.

We have often referred to this before and speak of it at this particular time because at this season of the year farmers are repairing their fences and the work of grounding the wires is a very simple matter, involing nothing but a little time and expense. Bear in mind, however, that in order that this protection may be effective, the wire must go down into moist earth, and the farther it goes down the better. In some soils three or four feet is sufficient; in other soils it should go down seven or eight feet.

Notice how a lightning rod man grounds his wires. He does not dig down six or eight feet, but six or eight inches, then pours a bucketful of water into this hole, then runs his rod down as far as he can, takes it out, fills this hole up with water, and in a few minutes has his rod down eight feet if necessary. The farmer can very easily adopt his methods.

We are quite earnest in urging this matter upon our readers. Next January when the mutual insurance companies present their annual reports it will be found, as it has been found in years past that the largest sums have been paid out for stock killed by lightning and by far the largest per cent of this money has been paid for stock killed by unground wire fences. Surely it is an easy matter, even if work be rushing, to ground every fence on the place before the lightning season is upon us. We do not pretend to say that a grounded fence will protect the live stock in the whole field. The danger of loss of stock by lightning can not be entirely eliminated. but we do say that a property grounded wire fence is the safest place for stock in the field, and it is where they are most likely to go during a heavy storm.

We assume in all this that our readers understand the philosophy of the lightning rod. As the cloud charged with positive electricity passes over the field or farm, negative electricity is developed in that field or farm. The more heavily charged the cloud is with electricity, the more heavily charged will be the farm underneath. A stroke, which is simply the passage of electricity up or down between the cloud and the earth, is therefore almost inevitable, thus equalizing the electricity between the cloud and the farm. Strokes are quite as frequently up as down. They are also aware that electricity will pass off a sharp point silently and quitely. If, therefore, there is positive electricity in the cloud above and negative electricity being developed in the field below, the barbed wire being used, with good ground connection, this negative electricity passes off into the air as it develops, thus relieving the soil beneath and preventing the possibility of a stroke. This is the philosophy of the lightning rod, and the same principles apply to the barbed wire fence.

Where woven wire and barbed wire are combined in making the fence, the woven wire should have metallic connection with the barbed wire and with the ground, thus enabling a free passage for the developing current of electricity.

Our readers may wish to know what we mean by negative and positive electricity. They are simply terms which scientists have invented to express two opposing forces. To illustrate further what we mean, if any of our readers will put one of his boys on a piece of beeswax or a piece of glass or a stool with glass on the legs and thrash him a few times with a cat's skin, especially a black cat, he will find the boy so fully charged with electricity that his hair will stand on end "like quin prickling porcupine." If now he will present to the boy an awl or some other steel or iron instrument the electricity will be drawn out from him, frequently without a spark, but if he will present to him a blunt piece of iron say one inch in diameter, the electricity will still pass off, but with a very perceptible spark and shock. This explains why the lightning rods are sharp pointed and why the barbs on the wire act as lightning rods in protecting the farm, only, however, if they are properly grounded in order to allow the developing negative electricity to pass out into the air without violence.

TREATMENT OF FENCE POSTS TO INCREASE DURABILITY.

BY H. P. BAKER, FORESTER TO THE STATE EXPERIENCE STATION, AMES, IOWA.

Even with the increased use of cement and steel there is an increasing use for wood in all industries, but wherever wood is used to any extent there is a tremendous amount of work and expense due to various kinds of rotting. Four things are necessary for the natural decay of timber, namely, water, air, heat and some fungous growth. If one of these factors is absent, decay cannot take place, though many have believed in the past and many still believe that decay takes place without the aid of fungi. It has, however, been proved beyond question that spontaneous decay or oxidation of wood, cannot occur, hence if we can prevent the presence of one of the above mentioned factors of decay, we can preserve wood to be used for any purpose indefinitely.

Noah was told to pitch the ark within and without and Pliny recommended oil of linseed to preserve the statute of Minerva. In parts of Egypt where rainfall is extremely small, wooden structures have stood for centuries because of the dryness. The great Brooklyn bridge is built upon wooden foundations which are below low-tide mark. Air cannot reach these wooden foundations, hence there can be no decay. It has been known for centuries that the charring of wood tends to preserve it. and this old and simple method can still be used to great advantage when more effective methods of treatment cannot be given.

By far the cheapest and at the same time a sure method of wood preservation is thorough seasoning. It is a common fact that if a post or pole be cut at the right time of the year, peeled and thoroughly seasoned that it will out-last, often by years, a post of the same species is unpeeled and set green. This method of preservation can be practiced by any one without cost. Charring, as already mentioned, is an extremely valuable method of preservation and can easily be done at the season of the year when labor is cheap. The old methods of smoke and water seasoning are good, but take more time than we have in this busy age. The chief value of smoke seasoning lay in the fact that the creosote of the smoke was taken up by the drying wood. Lime water also hinders decay somewhat, but where exposed to the weather washes off too easily. Any salt or oil to be practical as a preservative of wood must be cheap, easily applied, not injurious to the fibers of the wood, and not easily washed out. Numerous chemical salts are used, but the best material so far found is the oil of tar. This may be gotten in several different forms, such as crude petroleum, which while cheap, has an extremely disagreeable odor and is very inflammable. Probably creosote is the most common form of this oil used in the various preserving plants of the country.

Experiments in timber treating at the Iowa state college are being carried on in co-operation with the United States bureau of forestry. The accompanying photograph shows a treating tank in operation on the grounds of the state college. In the experiment carried on, posts of several different species are being tested, such as cottonwood, silver maple, boxelder, and willow. These posts were cut and peeled in 1904 so that they were thoroughly seasoned before treatment. The lower third of the posts are boiled in creosote for from four to eight hours. In this way it has been found that the posts take up from three to seven pounds of oil in the portion treated, depending somewhat upon the species. It has been proved beyond doubt that if the fiber of a piece of timber can be thoroughly impregnated with tar oil that decay can not take place. The problem comes in determining a cheap and efficient method whereby the oil may be gotten into the post. The experiments have not been under way was sufficiently long to determine absolutely the effects of this method of treatment upon the various species tested. However, from similar experiments carried on by the United States bureau of forestry in co operation with whom these are being carried on at the college, there is every reason to believe that willow or other soft-wooded posts which have taken up four or five pounds of oil, will be much more durable than the best cedar and oak posts. Decay always takes place just at the surface of the ground or immediately below, hence it is necessary to treat only that portion of the post below and to a few inches above the ground.

As the United States bureau of forestry wishes to obtain more accurate data in the matter of fence post treatment, it has been decided to continue the plant at this college for several years. During this time more valuable results can be obtained than could be gotten during one series of experiments. For these first experiments several residents of the state furnished posts of various species which were cut and peeled according to suggestions from the experiment station. Transportation was paid to and from the college and one-tenth of the posts were retained for the purpose of giving thorough tests. The remaining ninety per cent were returned to the owner, who not only has a number of posts thoroughly treated with oil, but he has also been of material assistance in the carrying out of these post treating experiments. Those who are interested in this line of work, which will probably mean a great deal to the users of posts in this state and who desire to co-operate with the experiment station are requesed to correspond with the forester of the state college. The final success of these experiment will mean the possibility of using to great advantage the very large amount of soft-wooded timber now growing in the state and it may also mean that the growing of soft-wooded posts, which can be produced in from five to eight years, may become a practical commercial proposition.

THE STRENUOUS LIFE, AND WHERE ARE WE AT.

FLORA R. WOOD, BEFORE THE LINN COUNTY, FARMERS' INNSTITUTE.

For years we have heard this saying, "The American people are living too fast." We can note the effect by looking on the faces of the people, more especially in the cities. Hurried, restless, woebegone, and on many a look of despair. The strenuous life seems to be a national disease.

And the best I can hope to do with this great question is to speak of a few of the causes and suggest, if I may, a remedy, if persisted in will in a measure alleviate.

The prime cause of the strenuous life in most cause is the desire for gain—to have just a few more dolars than someone else.

Look for moment at the rich and wealthy classes. In many cases they will barter everything worth living for—Faith, Hope and Charity,—faith in God, hope of heaven and charity for their fellow man.

After the gain of wealth, as they come to the eventide of life, many will be prone to say "What shall it profit a man if he gain the whole world and lose his own soul, or what shall he give in exchange for his soul." We have all heard of such cases, and the desire to live over again. But we will pass this way but once. Dissatisfied with the past and present, no hope for the future, is the cause of many I have spoken of.

The next case I will speak of is the very poor class. Their lives are strenuous by the ceaseless strife for their daily bread, and many times are made more strenuous by those who have them in their power. We often hear that worry kills more people than work, yet we cannot censure this class for the look of worry stamped on their faces. Toil, poverty and the poor house loom up in the distance in their imagination. So this is where they think they are at whether they are not.

The next class of which I will speak is the well-to-do—the comfortable class. This is the class in which the farmer belongs, for if anyone ought to be comfortable and happy it is the farmer. So the strenuous life in this case is mostly imagination. Sometimes as we see the more favored one rent his farm and move to town and we meet him on the street with his "biled shirt" on and stand-up collar, we bemoan our fate that we have to labor. So we fret and fune out of envy pure and simple. We do not take into consideration that we can do live on the fat of the land. We do not have to eat beef or chicken that buyer or seller can't tell how old it is. Then again we can enjoy all of God's out doors without the noise and tumult of the town.

When we talk of the strenuous life of the farmer it is all bosh. This is the remedy I am glad to offer to all who imagine their lives strenuous. Count your blessings. Get a little sunshine into your lives. Give yourself a holiday. Have a family picnic. Don't work so hard on Saturday that you will be too tired to go to church on Sunday. Go to every farmers' institute you hear of. Take the whole family, yes even take the dog, but remember he must be thoroughbred.

THE TIME TO SELL.

BREEDERS' GAZETTE.

When the father of the writer was a backwoods lad he and his brothers made a trap for wild turkeys. It was a rail pen in the woods with a door on one side that would fall when a string was pulled. From this door he laid a trail of corn out along a game-frequented path and corn was placed inside the trap. Then the boys stationed themselves to watch. Fortune favoring them soon came a pair of old turkeys and fourteen nearly grown young ones and finding the corn started eagerly upon the trail, picking it grain by grain. They reached the pen, some went in and the boys' hopes rose. More went in; all was tense excitement behind the blind. All the young ones were in; then the mother of the brood entered. "Pull the string, William," whispered the brothers. "Wait till the old gobbler goes in," he replied. "Pull tht string," they insisted. "Wait, I say; we want them all." Out came the old hen. "Pull, pull." "Wait till she goes back in." Out came two young turkeys. "Pull the string, William," was the demand, despairingly. "Wait till they go back, I tell you."

More came out. Finally the string was pulled. One runty youngster was imprisoned, the rest flew away.

Afterward when William was a man he was offered 11 cents per pound for his live hogs. He needed 12 and held them—only to peddle out the dressed meat, home-cured, at 11 cents. A neighbor of William was offered $1.35 for his wheat. He decided to hold for the inevitable $1.50 and sold instead for 93 cents.

The writer, having several cars of fat lambs to sell, was offered $7 per cwt. for them. He wanted a little more money than that to make his accounts look just right and declined the offer. He has the lambs yet, waiting in hopes the old hen may go back!

The moral? Only the rich can afford to scoop the whole pile. The poor should be content with the old hen and her fourteen young ones.

THE RETIRED FARMER.

The following was a paper read before a Farmers' Institute in eastern Iowa by a gentleman who was himself a retired farmer, but who is now actively engaged in business. We give it, not only for the philosophy of the argument but for its literary merit:

A bank note retired is a dollar redeemed; a farmer retired is a man forever lost. Leaving the farm results usually from one or two causes a weariness of the flesh, or an inability to secure from others, the necessary labor and thought to keep things moving.

As a rule the head of the family overestimates his own importance in the operations of the farm and has persuaded himself that his presence is actually necessary to every detail. Now, as a matter of fact, the world will go on when he is only remembered in marble; and his return after an absence of years would be attended with more surprise than delight.

Now my brother farmer, if you can conclude to quit the farm, live in town and rest and recreate all the time, why not commence now, while in possession of physical vigor and full manhood, and rest and recreate a part of the time? The infirmaties of age, decrepitude and a general impairment of the faculties is a very poor equipment for getting dividends out of leisure, or happy returns from a retired life. The history of the retired farmer as a rule is an obituary; an immediate death with the obsequies and burial deferred.

Smith, having disposed of his farm and the accumulations of a lifetime will be ready to move to town as soon as the assessment has been taken, for he has learned that taxes are high in town and he wants to escape the first year. Being comfortably settled in his new home, he dons a well brushed suit and walks down town to spend an hour with the merchant who has cultivated and caressed him during his many years on the farm. Before the end of the month he remarks to his wife that the merchant has lost his amiability and there is a chilliness in the greetings he receives from the busy men of the town. He discovers that his successor on the farm is now a favorite with the merchant. Smith is a squeezed lemon and has joined the ranks of retired farmers—a force in the town that stays well in the breeching but never lays into the collar. Smith complains that his wife is devoting more time to the W. C. T. U. than her home. His son has developed some luxurious habits and his daughter's wardrobe has gained a lap on his interest coupons.

He enters the second year with regret and closes it without hope. The machine that was making dollars for a lifetime is now melting them. The stimulent of sunshine, work and farm interest no longer sustain him. The worries of life, real and imaginary, envelop him and the critical period has arrived. The lawyer and banker have indicated their willingness to settle his estate and close his earthly career. Smith, in anguish of soul, tells the doctor "he wishes he could die," and that accomplished gentleman assures him he is doing all he can, which is doubtless true. And thus the once energetic factor of the farm quits life a loser. The family and community make no objection to the last obsequies. Wm. Lloyd Garrison and Senator Hoar had become estranged and at Mr. Garrison's death Mr. Hoar was asked to attend the funeral; he said, "No, I shall not attend Mr. Garrison's funeral, but I approve of it."

Now, my brother, I have an opinion that if a man become obsolete in his calling in life, it is his own fault. Generally the retired farmer simply does with himself what he did with his worn out McCormick—sent it to the junk pile. The essence of life is mind, and if you would prevent physical decay, keep the fire burning in the mental grate. You are fortunate if in early life you have mingled with business men and made room in your head for modern ideas and improved methods. And now do not prevent the boys getting into the harness of practical, intelligent, successful men. Don't throw away the oars simply because it tires you to row. Stay in the boat and teach the boys to row, but do not insist on landing on the same muddy beach your grandfather did. Form a cabinet with the boys and girls, discuss the question, and cast but one vote yourself. Make them interested partners in the farm operation, with opportunity to grow and learn, and they will not spend your money in a shell game when you are dead.

Listen to the admonition of one you have regarded a silent partner for a lifetime. In the years gone by you led from the alter to the then humble home, a sweet, trustful and loving girl, the only one in all the world always willing to forgive you. She is a mother now, her hair is silvered with the years, her affections have broadened as the brood increased. Possibly she is not learned in the ways of modern business, but she has intuition, and in that sublime intelligence that a good woman always possesses, she says, "John, we had better keep the farm. Here we have learned to meet the disappointments of life, within these walls we have met the ordeals meted out to husband and wife; the shadows of the evening of life are gathering now and we cannot see to lead the boys and girls in paths we never trod. The music of the murmuring winds that swept these pines were once a lullaby that soothed and softened the children's cares, their dirge-like tones now mingle with the music of another shore. And in the sacred precincts of this farm home, John, let's wait and calmly meet the mystery of life."

ALCOHOL BILL IS IMPORTANT.

WILL BENEFIT FARMER WHO PRODUCES RAW MATERIAL.

JAMES E. DOWNING, in Register and Leader.

The removal of the internal revenue tax on alcohol is of vast importance to the state of Iowa. Not only will it benefit the farmer, who produces the raw material from which alcohol is made, but it wil contribute to his further advantage in a cheap and safe motive power for use on the farm as well as light and heat for his home. The removal of the revenue will also tend in no small way to withdraw the embarrassment which accompanies the public announcement of the dividends of the Standard Oil company. In other words, free alcohol as an open competitor of the products of this company is calculated to cause a decline in oil values that will be entertaining to say the least.

The bill provides that free alcohol does not carry with it a license to indulge in the original intoxicant as a beverage. It contemplates that ample protection shall be provided along this line by demanding that it shall contain an obnoxious substance which will cause the indulgent but indiscreet imbiber to ascend the "golden stairs" at a speed which medical science will find difficult to arrest. Denaturized alcohol does not mean a medium for producing a state of hilarity but is for commercial purposes only. The mixing of some obnoxious and poisonous fluid with the original affords ample protection to the government and at once produces an undrinkable article.

It is not difficult to point out the far reaching effects which the removal of the tax will have upon the industries of this country, and it is equally simple to produce proofs to show that free alcohol is based upon sound economic principles. As matters now stand in this country, alcohol for beverages and industrial alcohol are subject to a tax of over $2.09 per gallon. Industrial alcohol, according to the department of agriculture, could be sold profitably, were there no tax on it, for about 15 cents per gallon; and under the increased demand that would be sure to follow, it is possible it could be sold profitably for 10 cents a gallon.

VALUABLE AS INDUSTRIAL MATERIAL.

The fact that the United States is the only important manufacturing and commercial country in the world which makes no distinction between alcohol as a beverage and high proof alcohol used in the arts and manufactures, is due chiefly to the popular lack of knowledge as to the value of alcohol as an industrial material.

Alcohol is absolutely necessary in the organic and chemical industry, and in the manufacture of the great majority of such chemicals large quantities must be used. Owing to cheap alcohol the German manufacturers in these lines have developed their industries so that they are the foremost in the world, and have secured almost the entire trade in neutral markets. Not only this, but they sell large quantities in this country, the advantage resulting from cheap alcohol being sufficient to enable their products to be sold here in spite of our protective tariff. The total manufacture of fine chemicals in this country is valued at less than $5,000,000 while the value of these articles exported by Germany exceeds $50,000,000.

It is important to note that ethyl, or grain alcohol, is the only domestic material essential to many important manufacturing processes, and highly valuable for general, industrial purposes, which is subject to an internal revenue taxation. All other domestic articles on which an internal revenue is imposed are finished products which enter into consumption on payment of the tax, and are not used as an industrial material by manufacturers.

Thus the sale of plug hats, for instance, is necessarily confined to men of wealth because of the fact that alcohol of the best grade is liberally used in their construction. The high price in these days of trusts places them beyond the reach of the average man as a dress hat.

The revenue laws of all other commercial nations of the world, including Great Britain, Germany, France, Austria-Hungary, Italy, Belgium, Holland, Russia, Switzerland, Norway, Sweden, Denmark, Cuba, Venezuela, Brazil, Argentine Republic, Chili and Peru distinguish between beverage and industrial alcohol used only for industrial purposes.

HOW ALCOHOL IS USED.

The use of alcohol as an industrial material figures prominently in the manufacture of nearly 100 different articles. These range from articles of household use and necessity to electrical machinery, ammunition and firearms. But few luxuries find a place in the list. The more common ones are as follows:

Stiff hats, silk hats, women's and children's straw hats, smokeless powder, fulminate of mercury, cartridges, artificial silk, picture frames, mouldings, manufacturers of metal goods, including hardware, brass beds and brass trimmings of iron beds, gas and electrical fixtures, lamps, brass musical instruments, electric fans, bird cages, clocks, toys, etc., coal tar dyes, celluloid, zylonite, fibreoid and all manufactures of nitro-celluloid compounds and pryoxlin plastics, photographic supplies, electric generators and motors lead pencils, watches and clocks, ole-stearine or steric acid, automobile power boats and small stationary combustion engines, furniture and other polished wood productions including railway and passenger street cars, carriages, pianos, organs, billiard tables, burial caskets, rattan goods, and all polished wood interiors, whips, trunks, shoe dressing, patterns, shoes, fireworks, emery wheels, pipes, umbrellas and cane handles and novelties, chloroform, fusel oil, transparent soap, etc., etc.

ALCOHOL FOR LIGHTING AND HEATING.

The importance of cheap alcohol is now so well appreciated in Europe that in all of the leading countries exhibitions to promote its industrial uses are held annually. In a special report on the exposition held in Berlin, United States Consul General F. H. Mason referred to the use of alcohol for lighting and heating and other domestic purposes as follows:

In the department of lighting and heating, display of lamps, chandeliers, street and corridor lights, in which alcohol vapor burns with an incandescent flame which rivals arc lights in briliancy and requires to be shaded to adopt it to the endurance of the human eye, there has been a great improvement in the lamps and chandeliers for alcohol lighting, which are up to the best standard of modern fixtures for gas and electricity, with which alcohol lighting is now competing with increasing success in this country.

The ordinary shade hand lamp for every day use is made of bronze with white porcelain shade, costs from $1.50 to $2.50, according to size and design. gives a light or thirty candles at a cost of alcohol of one-third of one cent per hour.

Similarly attractive and interesting is the large display of alcohol heating stoves which for warming corridors, sleeping rooms, and certain other locations are highly esteemed. They are made of Japanned iron plate in decorative forms, with concave copper reflectors and are readily portable and furnish a clean, odorless and convenient heating apparatus. Cooking stoves of all sizes, forms and capacities, from the complete range with baking and roasting ovens, broilers, etc., to the simple tea and coffee lamp, were on display.

Alcohol burns readily under all conditions without smoking, and is free from disagreeable odors. The alcohol lamps of various kinds for all purposes are similar in design to the ordinary oil lamps. The light is, however, of the incandescent mantel style, similar to that produced by gas. It is pure white in color, brilliant, and is, therefore, of a superior quality. Colors are readily distinguished the same as by daylight. It is not affected by draughts. It does not flicker. Owing to the perfect steadiness and daylight whiteness of the light, there is but little fatigue to the eyes in either reading or sewing by it. From the standpoint of cleanliness and saving of labor, it is equally ideal. The wick does not char or gum up, and it is, therefore, unnecessary to repeatedly regulate it. When once adjusted, it will burn until exhausted, giving a uniform light whether the fluid be low or high in the lamp. In fact, it has no bad habits such as the oil lamps, at is neither smokes or goes out nights. There is but little heat, the heat combustion being converted into light by the mantel. Broken chimneys are a rarity. The wicks and mantels last a long time. The lamps are safe, and the storage of a quantity of alcohol is not objected to by insurance companies; being of a constant composition and not a varying mixture, as is kerosene, a uniform supply can always be obtained.

ALCOHOL FOR COOKING.

The alcohol cooking stove being an exceedingly compact and convenient affair, the labor of the kitchen is much lightened. No coal, ashes, or dust. Fires are started instantly. As soon as the cooking is finished they may be extinguished immediately, a saving of time and fuel. The non-smoking and odorless flame is especially desirable for broiling. The heat can be regulated to a nicety, and absolute uniform temperatures maintained. The cost of an alcohol stove is much less than the average cooking stove. There are not parts to burn out and, therefore, no costly repairs.

AS MOTOR FUEL FOR FARM ENGINES.

The one man who stands in line for the greatest benefit of free alcohol is the Iowa farmer. A greater demand will be created for the products of the farm and in return, he will be able to buy a motor fuel at a cost so low that power will be utilized liberally in connection with the work on the farm.

The rapid growth in the demand for liquid fuels has more than doubled the price of gasoline during the past five years, and the fuel bill for a five-horse power engine, ten hours per day, has increased from $100 to $150 yearly. If this advance is not checked by the introduction of a satisfactory substitute, there is every reason to expect that the fuel cost will increase even more rapidly in the future, and in short time reach a point prohibitive to all but rich owners of automobile and pleasure boats.

It has been estimated that making alcohol available as fuel by removing the tax would double the power uses in this country. This would mean an aggregate increase in engines of over ten million horse power, and if these were employed one-third of the time an addition to the working force of the country of a thousand million horse power hours. At one-tenth of a gallon per horse power this would require the annual consumption of one hundred million gallons of alcohol.

Probably in no state in the union have gasoline engines for farm use been introduced more rapidly in the past two years than in Iowa. The average price paid by the Iowa farmer for gasoline in ten gallon lots has been around 15 cents. This quantity entitles him to a better price than that quoted him by the retailer. The very general use to which gasoline engines are employed in the work about the farm has made the item of fuel a most important one, for while a great saver of labor, they can at the same time be made an expensive luxury.

FARMER'S INTEREST IS TWOFOLD.

The farmer's interest in alcohol and the movement for the removal of the tax is therefore twofold. First, as the producer of raw material from which it is distilled; and, second, through the possibilities of cheaper power fuel and light which would be afforded them through the adoption of the Boutel bill. Corn is the principal raw material in this country from which alcohol is made. It can also be made from other materials, such as potatoes, beets, unmarketable fruits, damaged grain, etc. A large industrial consumption of alcohol would give the farmers a sort of balance wheel, guaranteeing them a sure market for their surplus and otherwise unsalable crops. Furthermore, the nature of the fluid permits of its being kept for years if necessary, hence when a large crop is raised which tended to create a surplus and depress prices, the surplus could be easily converted into alcohol and stored to prevent any marked reduction in prices in case of failure from short crops the following year.

The question has been raised as to whether extensive changes would be necessary in the gasoline engines now in use on farms in Iowa, in case alcohol should want to be used instead. This question has been given careful consideration by the manufacturers of these engines, and their reply is that the changes would be slight, if any at all; in fact, gasoline engines have been operated experimentally with wood alcohol and the engine made to perform every function intended of it. The introduction, therefore, of a new liquid fuel in the form of denaturized alcohol would not cause any interruption in the workings of the farm equipment on the farms of this state. The internal combustion engine is only in its infancy. It is the simplest and most economical of prime movers, and is destined to an enormous growth. The leading agricultural manufacturers are making extensive arrangements to manufacture engines of this class on a large scale, and the prominent thresher manufacturers are experimenting to produce the most perfect internal combustion portable farm engines, and are only waiting favorable motor fuel conditions to adopt this type of engine entirely.

SOURCES OF SUPPLY.

Alcohol is found everywhere. It is easily extracted from a great number of plants and products containing sugar—fecule, beets, sugar cane, molasses, wine, dregs of wine, grape, pulp, fruits, potatoes, rice, yams, sorghum corn, manico, residue of breweries, roots, etc. It is in this land of corn that the importance of the application appeals so strong. The agriculturist should bear in mind that a greater demand will be created for his corn in event the revenue is removed from alcohol, better prices must necessarily prevail, the off-products will have a commercial value, and thus the results will be a larger profit. In the sugar belt it is of equal importance. For these two agricultural industries besides, not to mention the other by-products, are an excellent food for cattle, rich in ingredients easily assimilated.

The following is taken from an official document:

Corn is admittedly the best alcohol producer in the world, and corn alcohol can be produced in this country cheaper than any other in the world. With proper rules and regulations which would put our people upon an equality in the matter of facilities for presenting their product to the markets of the world, with our improved machinery and appliances in use for the distillation of our alcohol our product would practically control the world's market for alcohol. (Senate reports, Vol. 2, No. 411, 55th congress, second session 1897-8, page 369).

ALCOHOL IN CORN STALKS.

Based upon figures furnished by the department of agriculture at Washington, D. C., the humble cornstalk of the crop raised in Iowa the past season would produce 1,500,000 gallons of alcohol. In a recent letter to a friend bearing on this subject, Secretary Wilson said:

During the past twenty-five years experiments have been frequently made in this country which shows that the cornstalk at the time when the grain is hardening contains from 12 to 15 per cent of sugars and other fermentable matters. If these sugars could be fermented at this time it is easy to see that they would produce an amount of alcohol far in excess of all that is used in the world for technical purposes and beverages.

A ton of cornstalks at the period of growth mentioned will contain about 240 pounds of fermentable substances. These substances would yield about half their weight in absolute alcohol. In round numbers we may say that a ton of cornstalks in the condition mentioned will produce about 100 pounds of absolute alcohol, or 200 pounds of proof spirits. As a gallon of proof spirits weighs seven pounds, a ton of cornstalks would produce about thirty gallons of proof spirits, or fifteen gallons of alcohol. It is remarkable that Indian corn at that period contains as much if not more alcohol than is found in the grain itself. The stalk of sweetcorn contains more sugar than that of the field corn. If the stalk be utilized for alcohol making it would have to be at a time when the grains are hard and usually before or soon after the advent of frost. It might be possible to devise methods of drying the stalks or preserving them in silos, looking to the subsequent utilization of the products for the manufacture of alcohol.

It is evident that as natural gas, oil and coal become scarcer some other source must be found for fuel and light. It seems probable from a careful study of all the conditions of agriculture that alcohol is destined to be the fuel of the future. It is the part of wisdom, therefore, in those connected with the agricultural interests of the country to exploit as far as possible all the various sources of supply. In this country the stalk of Indian corn, the yam, and the sweet and Irish potato are promising sources of alcohol in the future.

AS A TRANSPORTATION POWER.

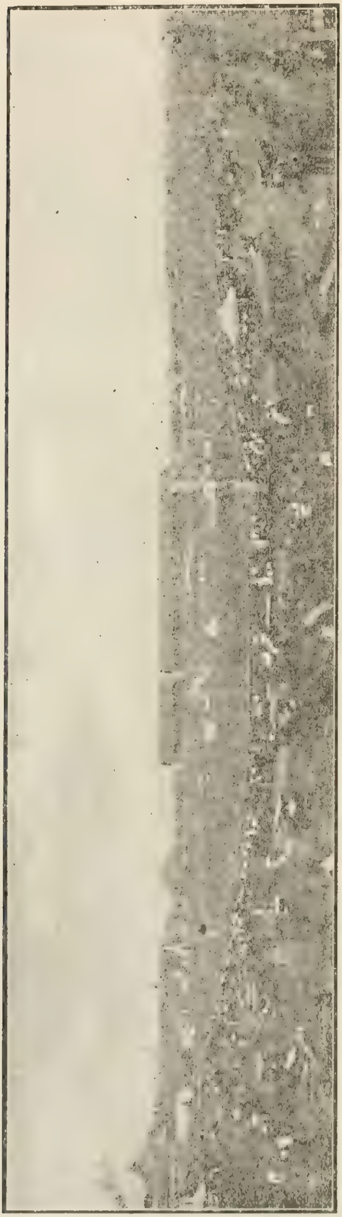
The following description of the Union Pacific's new motive power for branch and suburban lines is of especial interest in connection with the use of alcohol as a transportation power. What has been accomplished with gasoline as a liquid fuel can be accomplished with like results by the use of alcohol.

"Union Pacific Motor No. 2" is the inscription on the second gasoline motor car which has been completed in the Union Pacific shops in Omaha, at which place it was given a trial trip when it glided over the rails at a speed of fifty-seven miles an hour with the ease of a bird, and less jar and noise than is experienced in a Pullman car going at half that speed. Car No. 1, built last winter, was an experiment; car No. 2 is a commercial success and has demonstrated that its builder has revolutionized suburban and interurban traffic as well as solved the problem of giving fast and frequent service on branch lines of railroad.

W. R. McKeen, Jr., superintendent of motive power, is given the credit for the invention. Scientifically and commercially the greatest feature of the invention is the demonstration of the practicability of liquid fuel as a transportation medium. The absence of dust and smoke and the opportunity of inhailing fresh air, makes a ride on this car especially attractive. The field for the motor, to start with, is in branch line service, but its scope is so broad and the requirements so great on many roads that it will no doubt be years before demand for them can be met.

A number of branch lines that are now operated at a loss could be placed on a dividend basis by the use of gasoline power cars instead of steam trains. In place of an engineer, fireman, conductor and brakeman all that is required to operate a gasoline car is one man. Instead of an engine consuming tons and tons of coal the new motor uses but three quarts of liquid fuel per mile. In cities where electric cars are running in competition with the steam roads one of these motor cars could be operated on the steam tracks, intermingle with steam trains and give the same frequency of service as do electric cars on the trolley roads.

An additional advantage gained in the use of alcohol would be the splendid light which could be furnished each car and heat as well. The same quantity of alcohol would operate the car as gasoline, if not less, for the alcohol has a better body and does not evaporate or waste to the extent that gasoline would. It is merely one example of the possibirities of untaxed alcohol as showing the problems of transportation it would solve.



Showing an afternoon crowd at the races, Iowa State Fair, 1905.

PART IX

OFFICIAL REPORT

OF AWARDS IN LIVE STOCK DEPARTMENTS AND PRESS REPORTS OF THE

IOWA STATE FAIR

With Other Articles Regarding Fairs in General

AWARDS

IN LIVE STOCK DEPARTMENTS

IOWA STATE FAIR, 1905.

HORSE DEPARTMENT.

Superintendent ....M. McDonald, Bayard, Iowa.

STANDARD BRED TROTTERS.

EXHIBITORS.

C. E. Alexander, Des Moines, Iowa, George Arnold, Sedalia, Missouri; A. Y. Art, Hartford, Iowa; John W. Bruere, Tracy, Iowa; W. W. Davis, Des Moines, Iowa; W. W. Garner, Des Moines, Iowa; W. W. Gill, Pakwood, Iowa; Charles Henley, Des Moines, Iowa; Tom James Des Moines, Iowa; J. A. Mason, Carlisle, Iowa; C. E. Monahan, Des Moines, Iowa; C. D. McPherson, Fairfield, Iowa; J. R. Peak & Son, Winchester, Illincis; Ed. Person, Carlisle, Iowa; August Post, Moulton, Iowa; C. C. Prouty, Des Moines, Iowa; August Schroeder, Valley Junction, Iowa; J. Q. Spain, Hartford, Iowa; James Watt, Des Moines, Iowa; Wilson Bros., Menlo, Iowa.

AWARDS.

Judge ....W. A. Dobson, Marion, Iowa.

Stallion Four Years Old and Over.—First, Hail Cloud, 23606, James Watt; second, Barondale, 20184, Tom James; third, McNaught, 37395 J. R. Peak & Son.

Stallion Over Three and Under Four.—First, Mean Enough, 39709, J. R. Peak & Son; second, Ellerslie Wilkes, 38066, C. D. McPherson; third, Barondale Boy, Tom James.

Stallion Over Two and Under Three.—First Rastus Fun, 39768, J. R. Peak & Son; second, Trix of Fairfield, 39868, C. D. McPherson; third, Lew B., A. Y. Art.

Stallion Over One and Under Two.—First, Red Jeanses, J. R. Peak & Son; second, Jay of Fairfield, 39798, C. D. McPherson; third, Bay Rex, J. A. Mason.

Horse Foal.—First, Otto Schroeder.

Mare Over Four Years Old.—First, Anna Rietta, 700, John W. Bruere; second, Naretta, Vol. 12, J. R. Peak & Son; third, Molly F., C. C. Prouty.

Filly Over Three and Under Four Years.—First, Viveway, Vol. 17, J. R. Peak & Son.

Filly Over Two and Under Three Years.—First, J. R. Peak & Son; second, C. D. McPherson.

Filly Over One and Under Two Years.—First, Myrtle, J. R. Peak & Son; second, May, A. Y. Art; third, Coby of Fairfield, C. D. McPherson

Mare Foal.—First, James Watt.

Get of Stallion.—First, J. R. Peak & Son; second, C. D. McPherson; Third, James Watt.

Produce of Mare.—First, J. R. Peak & Son; second, A. Y. Art; third, C. D. McPherson.

CARRIAGE OR COACH HORSES.

EXHIBITORS.

John W. Bruere, Tracy, Iowa; J J. Lynes, Plainfield, Iowa; C. E. Monahan, Des Moines, Iowa; F. W. McIntire, Des Moines, Iowa; McManus & Johnston, Derby, Iowa; C. D. McPherson, Fairfield, Iowa; J. R. Peak & Son, Winchester, Illinois; August Post, Moulton, Iowa.

AWARDS.

Judge .... W. A. Dobson, Marion, Iowa.

Carriage Team, shown to Carriage or Other Vehicle.—First, J. R. Peak & Son; second, J. R. Peak & Son; third, J. J. Lynes.

Family Mare or Gelding, driven to Surrey or other Suitable Vehicle. —First, Black Bess, C. E. Monahan; second, J. R. Peak & Son, third, Jack, J. J. Lynes.

GENTLEMEN'S DRIVING HORSES.

EXHIBITORS.

C. E. Alexander, Des Moines, Iowa; John W. Bruere, Tracy, Iowa; Thomas Dean, Rudd, Iowa; S. J. Gabbart, Dearborn, Missouri; Tom James, Des Moines, Iowa; J. J. Lynes, Plainfield, Iowa; J. A. Mason, Carlisle, Iowa, C. E. Monahan, Des Moines, Iowa; McManus & Johnston, Derby, Iowa; C. D. McPherson, Fairfield, Iowa; J. R. Peak & Son, Winchester, Illinois; Ed Person, Carlisle, Iowa; August Post, Moulton, Iowa; C. C. Prouty, Des Moines, Iowa; F. W. Tutin, Des Moines, Iowa; Wilson Bros., Menlo, Iowa.

AWARDS.

Judge ....W. A. Dobson, Marion, Iowa.

Driving Team, (Pair) to Pole.—First and Second, J. R. Peak & Son; Third, Bedelia and Ophelia, F. W. Tutin.

Single Driver to Harness.—First, J. R. Peak & Son; second, Anna Rietta, 700, John W. Bruere; Third, C. C. Prouty.

MATCHED TEAM AND APPOINTMENT.

EXHIBITORS.

C. E. Monahan, Des Moines, Iowa; J .R. Peak & Son, Winchester, Illinois; C. C. Prouty, Des Moines, Iowa; F. W. Tutin, Des Moines,, Iowa.

AWARDS.

Judge ....W. A. Dobson, Marion, Iowa.

Pair of Mares or Geldings, Any Age, (15.1 hands or over) Driven to Vehicle.—First, Black Bess and Melrose, C. E. Monahan; second, J. R. Peak & Son; third, Bedelia and Ophelia, F. W. Tutin.

SADDLE HORSES.

EXHIBITORS.

A. Y. Art, Hartford, Iowa; H. G. Easton, Galva, Iowa; A S. Harris, Mystic, Iowa; C. E. Monahan, Des Moines, Iowa; O. J. Mooers, Columbia, Missouri; J. R. Peak & Son, Winchester, Illinois; A. J. Richardson, Mystic, Iowa; Richard Rollins, Des Moines, Iowa; Charles H. Stockdale, Des Moines, Iowa; F. W. Tutin, Des Moines, Iowa; D. Weeks, Des Moines, Iowa.

AWARDS.

Judge ....W. A. Dobson, Marion, Iowa.

Gelding Four Years or Over.—First, King Lee, 2nd, 1994, A. S. Harris; Second, Oakland Chief, A. J. Richardson.

Stallion Three Years Old and Under Four.—First, Mont H. Rose, Charles H. Stockdale.

Stallion Four Years Old or Over.—First, Star Russell, 1802, D. Weeks, Des Moines, Iowa.

Stallion Three Years Old and Under.—First, Mont H. Rose, Charles H. Stockdale.

Mare Four Years Old or Over.—First, Helen Walker, O. J. Mooers; Second, Georgia Rex, 1885, A. S. Harris.

Champion Stallion Mare or Gelding.—First, A. S. Harris.

HIGH SCHOOL HORSES.

Stallion Mare or Gelding.—First, Helen Walker, O. J. Mooers; Second, Oakland Chief, A. J. Richardson.

SHETLAND PONIES.

EXHIBITORS.

Horace L. Anderson, Des Moines, Iowa; J. W. Blackford, Hillsboro, Iowa; John Donhowe, Story City, Iowa; W. W. Gill, Packwood, Iowa; George A. Heyl, Washington, Illinois; R. A. Homes, Des Moines, Iowa; W. W. Garner, Des Moines, Iowa; Peter McMartin, Des Moines, Iowa; C. D. McPherson, Fairfield, Iowa; J. R. Peak & Son, Winchester, Illinois;F. C. Reugnitz, Stratford, Iowa; Charles H. Stone, Muscatine, Iowa.

AWARDS.

Judge ....W. J. Kennedy, Ames, Iowa.

Stallion Four Years Old or Over.—First, David Harum, 4146, Geo. A. Heyle; second, Blue Ribbon, 4916, Geo. H. Heyl; third, Bobolink, 4915, Geo. A. Heyl.

Stallion Three Years Old and Under Four.—First, Bloomer, 4704, Geo. A. Heyl; second, Toy, John Donhowe; third, Sam, 4722, Geo. A. Heyl.

Stallion Two Years Old and Under Three.—First, Kinzie, 5125, Geo. A. Heyl; second, Peter the Great, W. W. Garner; third, Royal Duke, 5218, Geo. A. Heyl.

Stallion One Year Old and Under Two.—First, Joyful, 5222, J. R. Peak & Son; second, Bobolink, 2nd Geo. A. Heyl; third, Blue Ribbon, 2nd, Geo. A. Heyl.

Stallion Under One Year.—First, Harum Major, Geo. A. Heyl; second, None Such, Geo. A. Heyl; third, E)lmer, C. D. McPherson.

Mare Four Years Old or Over.—First, Catrina, 1784, Geo. A. Heyl; second, Teddis, John Donhowe; third, Bessie, Charles H. Stone.

Mare Three Years Old and Under Four.—First, Vermont, Charles H. Stone; second, Lady Soux, Charles H. Stone; third, Bineta Bell, 4750, Geo. A. Heyl.

Mare Two Years Old and Under Three.—First, Alpha Dale, 5108, Geo. A. Heyl; second, Aggiee, Jr., 2nd, C. D. McPherson; third, River dale Roxie, 5080, Geo. A. Heyl.

Mare One Year Old and Under Two.—First, Gertie Harum, 5187, Geo. A Heyl; second, Vilette, 6535, Geo. A. Heyl; third, Bertha, Charles H. Stone.

Mare Under One Year Old.—First, Dandelion, Geo. A. Heyl; second, Dollie Harum, Geo. A. Heyl; third, Carrie, Charles H. Stone.

Shetland Pony in Harness.—First, Bloomer, Geo. A. Heyl; second Bobolink, Geo. A. Heyl; third, Beauty, John Donhowe.

Pair Shetland Ponies in Harness.—First, Blue Ribbon and Royal George, Geo. A. Heyl; second, Mammond and Vermont, Charles H. Stone; third, Beauty and Teddis, John Donhowe.

Tandem Team of Shetlands.—First, Bobolink and Blue Ribbon, Geo. A. Heyl; second, Royal Prince and Black Diamond, Geo. A. Heyl; third, Beauty and Teddis, John Donhowe.

Four-in-hand Shetland Ponies, or Four Abreast.—First, Bobolink, Blue Ribbon, Royal George and Vinette Belle, Geo. A. Heyl; second, Bloomer, Sam, Royal Prince and Black Diamond, Geo. A. Heyl; third, Dot, Prince, Beauty and Teddis, John Donhowe.

Shetland Pony Under Saddle.—First, Puzzle, C. D. McPherson; Second, Black Diamond, Geo. A. Heyl; third, Teddis, John Donhowe.

Shetland Stallion and Four of his Get.—First, Geo. A. Heyl; Second, John Donhowe; third, C. D. McPherson.

ENGLISH COACH BREEDS, CLEVELAND BAY AND HACKNEY.

EXHIBITORS.

Finch Bros., Verona and Joliet, Illinois; Truman's Pioneer Stud Farm, Bushnell, Illinois.

AWARDS.

Judge ....W. A. Dobson, Marion, Iowa.

Stallion Four Years Old and Over.—First, Wood Baronet, Vol. 22, Truman's Pioneer Stud Farm; Second, Ely 1st, Lord, Vol. 22, Truman's Pioneer Stud Farm; Third, Coronado, 8428, Truman's Pioneer Stud Farm.

Stallion Over Three Years Old and Under Four.—First, Stuntney Cox, Vol. 22, Finch Bros.

MORGAN.

EXHIBITORS.

C. T. Ayres, Osceola, Iowa; Thomas Dean, Rudd, Iowa; J. J. Lynes, Plainfield, Iowa; John P. Reynard, Osceola, Iowa.

AWARDS.

Judge ....W. A. Dobson, Marion, Iowa.

Stallion Four Years Old and Over.—First, Morgan Whip, 4300, John P. Reynard; Second, Dude, 4673, J. J. Lynes.

Stallion Over One Year Old and Under Two.—First, Thomas Dean.

Horse Foal.—First and Second, Thomas Dean.

Mare Over Four Years Old.—First and Second, Thomas Dean.

Filly Over Three and Under Four Years.—First, Lady H., John P. Reynard.

Filly Over One and Under Two Years.—First, Thomas Dean.

Get of Stallion.—First, Thomas Dean.

Produce of Mare.—First, Thomas Dean.

FRENCH AND OLDENBURG OR GERMAN COACH.

EXHIBITORS.

W. W. Garner, Des Moines, Iowa; Frank Iams, St. Paul, Nebraska.

AWARDS.

Judge .... W. A. Dobson, Marion, Iowa.

Stallion Four Years Old and Over.—First, W. W. Garner; Second, Frank Iams.

Stallion Over Three and Under Four Years.—First, Frank Iams.

Stallion Over Two and Under Three Years.—First, Frank Iams.

CLYDESDALE.

EXHIBITORS.

Conway, Carey and Raffenberg, Anita, Iowa; James McKinzie, Baxter, Iowa; C. D. McPherson, Fairfield, Iowa; August Post, Moulton, Iowa; W. W. Weston, Audubon, Iowa.

AWARDS.

Judge ....R. B. Ogelvie, U. S. Y., Chicago, Ill.

Stallion Four Years Old and Over.—First and Second, August Post, Third W. W. Weston.

Stallion Over Two and Under Three Years.—First, Sandy McNal, 11211, James McKinzie.

Horse Foal.—First, Prince Roudy, W. W. Weston.

Stallion Under Three Years old, Bred by Exhibitor.—First, Sandy McNal, 11211, James McKinzie.

Mare Over Four Years Old.—First, Duchess Regnant, 7195, August Post; second, Jessie, 6173, C. D. McPherson; third, Handsome Maid, 8934, W. W. Weston.

Filly Over Three and Under Four Years.—First, Wayside Cordelia, 10900, August Post; Second, Wayside Mildred, 10899, August Post.

Mare Over Three Years Old, Bred by Exhibitor.—First, Wayside Cordelia, 10900, August Post; Second, Wayside Mildred, 10899, August Post.

Produce of Mare.—First, August Post.

Grand Display.—Five Animals Bred by Exhibitor.—First, August Post.

ENGLISH SHIRES.

EXHIBITORS.

Conway, Carey and Raffenberg, Anita, Iowa; Finch Gros., Joliet and Verona, Illinois; W. W. Garner, Des Moines, Iowa; C. D. McPherson, Fairfield, Iowa; Truman's Pioneer Stud Farm, Bushnell, Illinois; Albert Zwicker & Sons, Preemption, Illinois

AWARDS.

Judge ....T. W. Bell, U. S. Y., Chicago, Illinois.

Stallion Four Years Old and Over.—First, Blaisdon Albert, 19350, Truman's Pioneer Stud Farm; Second, Prince Charles of Warsley, 19028, Truman's Pioneer Stud Farm; Third, Holms Prince, 7092, Finch Bros.

Stallion Over Three and Under Four.—First, Gorefield, 21469, Truman's Pioneer Stud Farm; Second, Blaisdon Beau, 21144, Truman's Pioneer Stud Farm; Third, Peakirk Duke, 22669, Truman's Pioneer Stud Farm.

Stallion Over Two and Under Three.—First Wrydesland's Champion 2nd, 22944, Truman's Pioneer Stud Farm; Second, Brown Chief, 7172, Albert Zwicker & Sons; Third, Lord Wilton, 7170, Albert Zwicker & Sons.

Stallion Over One and Under Two.—First, Cyclone, 7139, Finch Bros., Second, Seldom Seen, Albert Zwicker & Sons; Third, Money Maker, Albert Zwicker & Sons.

Horse Foal.—First, Finch Bros.; second, What We Want, Albert Zwicker & Sons.

Stallion Under Three Years Old, Bred by Exhibitor.—First, Brown Chief, 7172, Albert Zwicker & Sons; Second, Lord Wilton 7170, Albert Zwicker & Sons; third, Finch Bros.

Mare Over Four Years Old.—First, Stella, 6250, Albert Zwicker & Sons; second, Wenona Gussie, 4996, Finch Bros.

Filly Over Three and Under Four.—First, Black Bess, 7177, Albert Zwicker & Sons; second Pilot's Beauty, 7179, Albert Zwicker & Sons.

Filly Over Two and Under Three.—First, Silver Maid, 7175, Albert Zwicker & Sons; second, Finch Bros; third, Pilot's Flower, 7176, Albert Zwicker & Sons.

Filly Over One and Under Two.—First, Joliet Esther, 7868, Finch Bros; second, Duchess Maid, Albert Zwicker & Sons; third, Daisy's Favorite, Albert Zwicker & Sons.

Mare Foal.—First, Joliet's Queen, Finch Bros.

Mare Over Three Years Old, Bred by Exhibitor.—First, Stella, 6250, Albert Zwicker & Sons; second, Finch Bros.; third, Black Bess, 7177, Albert Zwicker & Sons.

Mare Under Three Years Old, Bred by Exhibitor.—First, Silver Maid, 7175, Albert Zwicker & Sons; second, Daisy's Favorite, Albert Zwicker & Sons; third, Pilot's Flower, 7176, Albert Zwicker & Sons.

Get of Stallion.—Four Colts, either sex, American bred. Get of same stallion; stallion may or may not be shown. First and second, Albert Zwicker & Sons.

Produce of Mare.—Two Colts, either sex, American bred. Produce of same mare; mare may or may not be shown. First and second, Albert Zwicker & Sons; third, Finch Bros.

Grand Display.—Five animals, bred by exhibitor. First, Albert Zwicker & Sons; second, Finch Bros.

PERCHERONS AND FRENCH DRAFT.

EXHIBITORS.

Conway, Carey and Raffenberg, Anita, Iowa; Loren Dunbar, Earlham, Iowa; Finch Bros., Joliet and Verona, Illinois; W. W. Garner, Des Moines, Iowa; T. B. Hammer & Sons, Indianola, Iowa; Frank Jains, St. Paul, Nebraska; C. S. Mershon, Newton, Iowa; J. G. Maasdam, Pella, Iowa; H. G. McMillan, Rock Rapids, Iowa; C. D. McPherson, Fairfield, Iowa; Truman's Pioneer Stud Farm, Bushnell, Illinois; C. W. Wicker, Altoona, Iowa.

AWARDS.

Judge .... W. J. Kennedy, Ames, Iowa.

Stallion Four Years Old and Over.—First, H .G. McMillan; second and third, Frank Iams.

Stalion Over Three and Under Four.—First, second and third, Frank Iams.

Stalion Over Two and Under Three.—First, Finch Bros.; second and third, W. W. Garner.

Stallion Over One and Under Two.—First and second, H. G. McMillan; third, J. G. Maasdam.

Horse Foal.—First, Loren Dunbar; second, H. G. McMillan; third, T. B. Hammer & Sons.

Stallion Over Three Years Old, Bred by Exhibitor.—First, Exhibition, 41339, J. G. Maasdam.

Stallion Under Three Years Old, Bred by Exhibitor.—First, Laurens, 41030, J. G. Maasdam; second and third, Morell, 40932, H. G. McMillan.

Mare Over Four Years Old.—First and second, H. G. McMillan; third, Cecil Jesse, 33383, J. G. Maasdam.

Filly Over Three and Under Four.—First and second, H. G. McMillan.

Filly Over Two and Under Three.—First and second, H. G. McMillan; third, J. G. Maasdam.

Filly Over One and Under Two.—First, C. D. McPherson; second and third, H. G. McMillan.

Mare Foal.—First, H. G. McMillan; second, J. G. Maasdam.

Mare Over Three Years Old, Bred by Exhibitor.—First, H. G. McMillan, second, J. G. Maasdam; third, H. G. McMillan.

Mare Under Three Years Old, Bred by Exhibitor.—First, second and third, H. G. McMillan.

Get of Stallion.—Four Colts, either sex, Amreican bred, get of same stallion; stallion may or may not be shown. First, H. G. McMillan, second, C. D. McPherson; third, Finch Bros.

Produce of Mare.—Two colts, either sex, American bred, get of same mare; mare may or may not be shown. First, H. G. McMillan; second, C. D. McPherson; third, H. G. McMillan.

Grand Display, Five Animals, bred by exhibitor.—First, H. G. McMillan; second, J. G. Maasdam.

BELGIAN.

EXHIBITORS.

Finch Bros, Joliet and Verona, Illinois; W. W. Garner, Des Moines, Iowa; Frank Iams, St. Paul, Nebraska.

AWARDS.

Judge .... R. B. Oglevie, U. S. Y., Chicago, Ill.

Stallion Four Years Old and Over.—First, David De Valle, 24318, Frank Iams; second, Ceasar De Heusden, 29342, W. W. Garner; third, Finch Bros.

Stallion Over Three and Under Four.—First, Capin, 33172, W. W. Garner; second, Frank Iams; third, W. W. Garner.

Stallion Over Two and Under Three.—First, Signor, 31806, W. W. Garner; second, Chinois, 30036, W. W. Garner; third, Frank Iams.

GRADE DRAFT, DOUBLE AND SINGLE MARES AND GELDINGS.

EXHIBITORS.

W. W. Garner, Des Moines, Iowa; C. D. McPherson, Fairfield, Iowa; H. H. Turner, Farrar, Iowa.

AWARDS.

Judge .... R. B. Oglevie, U. S. Y., Chicago, Ill.

Fastest Walking Team in Harness.—First, C. D. McPherson.

Pair of Geldings or Mares.—First, C. D. McPherson.

Single Gelding or Mare.—First, C. D. McPherson.

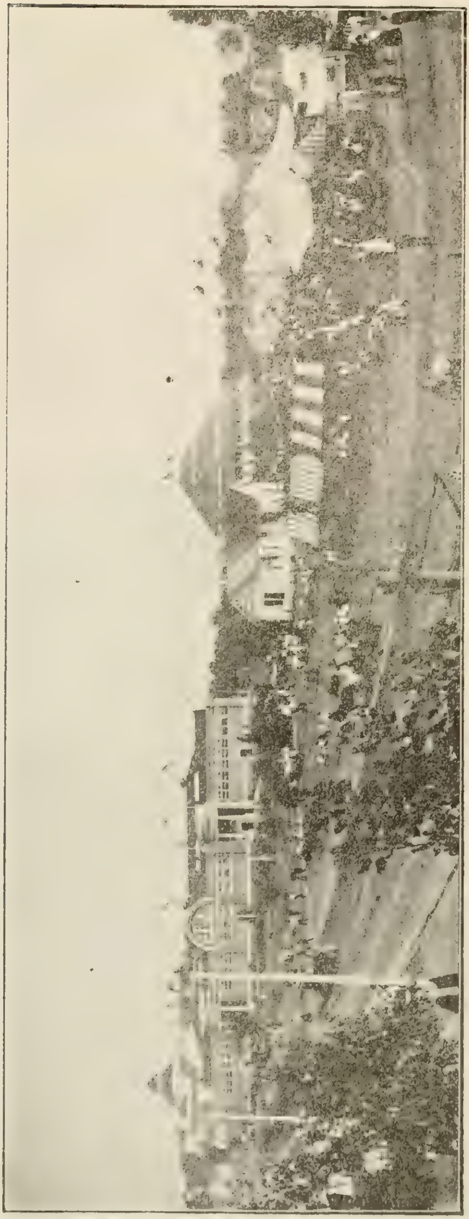
Brood Mare Over Four Years Old.—First, C. D. McPherson.

Mare Foal.—First and second, H. H. Turner.

MULES.

EXHIBITORS.

A. L. Foster, Winterset, Iowa; J. A. Mason, Carlisle, Iowa; C. D. McPherson, Fairfield, Iowa; H. L. Orcutt, Monroe, Iowa.



Scene on Iowa State Fair Grounds, 1905.

AWARDS.

Judge ....T. W. Bell, U. S. Y., Chicago, Ill.

Best Pair of Mules in Harness.—First, A. L. Foster; second and third, H. L. Orcutt.

Best Pair of Matched Mules.—First, A. L Foster; second and third, H. L. Orcutt.

Best Mule Three Years Old.—First, H. L. Orcutt; second and third, C. D. McPherson.

Best Mule Two Years Old.—First, H. L. Orcutt; second and third, C. D. McPherson.

Best Mule One Year Old.—First, H. L. Orcutt; second J. A. Mason; third, H. L. Orcutt.

Best Mule Colt.—First, H. L. Orcutt; second, J. A. Mason.

CATTLE DEPARTMENT.

Superintendent .... S. B. Packard, Marshalltown, Iowa

SHORTHORNS.

EXHIBITORS.

F. W. Akers, Laurel, Iowa; J. B. Brown, Solon, Iowa; G. H. Burge, Mt. Vernon, Iowa; Alex. Campbell, Botna, Iowa; Conway, Carey and Raffen berg, Anita, Iowa; John Creswell, Hillsboro, Iowa; F. A. Edwards, Webster City, Iowa; W. E. Graham, Prairie City, Iowa; F. W. Harding, Waukesha, Wisconsin; E. C. Holland, Milton, Iowa; N. A. Lind, Rolfe, Iowa; R. W. Livingston, Monroe, Iowa; Frank O. Lowden Oregon, Illinois; Tebo Land & Cattle Co., Clinton, Missouri; B. E. Mitchell, Vail, Iowa; C. N. Moody, Atlantic, Iowa; C. W. McDermott, Wiota, Iowa; J. R. Peak & Son, Winchester, Illinois; H. B. Quiston, Denmark, Iowa; John Rasmess, Lake City, Iowa; E. C. Sage, Denison, Iowa; C. A. Saunders, Manilla, Iowa; E. R. Strangland, Marathon, Iowa; C. A. Steward Ames, Iowa; Thomas, Jameson & Mitchell, Allen, Kansas; Asa Turner, Farrar, Iowa; C. R. Warren, Hillsdale, Iowa; R. E. Watts & Sons, Miles, Iowa; Michael A. Wagner, Freemont, Ohio; T. J. Wornall, Liberty Missouri.

AWARDS.

Judge .... W. J. Kennedy, Ames, Iowa.

Bull Three Years Old or Over.—First, Whitehall Sultan, 163573, F. W. Harding; second, Money Musk, 186542, G. H. Burge; third, Prince of Tebo Lawn, 172599, Tebo Land & Cattle Co.; fourth, Double Gloster second 138588, R. E. Watts & Son; fifth, Robin Adair, 151303, E. C. Sage; sixth, Cumberland Banner Bearer, 167064, C. R. Warren.

Bull Two Years Old and Under Three.—First, Whitehall Marshall, 209776, F. W. Harding; second, Kintore Lord, 210109, C. A. Steward; third, Marshal's Best, 227955, Michael A. Wagner; fourth, Sunrise, 224242, J. B. Brown; fifth, Secret Viscount, F. A. Edwards; sixth, Prince of Marathon, 229140, E. R. Stangland.

Bull One Year and Under Two.—First, Clear The Way, 231482, N. A. Lind; second, The Conqueror, 215051, Tebo Land & Cattle Co.; third, Sightseer, 224131, B. E. Mitchelll; fifth, Sidelight, 224241, J. B. Brown; sixth, King Victor, 239686, F. W. Akers.

Bull Calf Under One Year.—First Choice Goods Model, Tebo Land & Cattle Co.; second, Wampum of Wayside, G. H. Burge; third, Gloster' Knight, R. E. Watts & Sons; fourth, Scottish Admiral, 245030, W. E. Graham; fifth, Banner's Victor, 242584, C. R. Warren; sixth, First Choice, 242659, N. A. Lind.

Cow Three Years or Over.—First, Golden Abbotsburn, Tebo Land & Cattle Co.; second, Moneyfuffell Maid, Vol. 58, F. W. Harding; third, Lady Victor, Vol. 50, J. R. Peak & Sons; fourth, Jeannette B., Vol. 50, G. H. Burge; fifth, Lady Marshall, Michael A. Wagner; sixth, Fair Duchess (Imp.), Vol. 47, F. A. Edwards.

Heifer Two Years and Under Three.—First, Princess Flora, second, Tebo Land & Cattle Co.; second, Anoka Missie, F. W. Harding; third, Fenimore Princess, Vol. 60, F. A. Edwards; fourth, Countess of Wayside, Vol. 60, G. H. Burge; fifth, Michael A. Wagner; sixth, Pleasant Hill Duchess, E. R. Stangland.

Heifer One Year and Under Two.—First, Sweet Briar Rose, Tebo Land & Cattle Co.; second, Anoka Broadhooks, F. W. Harding; third, Floradora, Vol 60, G. H. Burge; fourth, Princess Maud 6th, F. W. Harding; fifth, Daisy third, Vol. 60, R. E. Watts & Sons; sixth, Pleasant Hill Duchess second, Vol. 61, E. R. Stangland.

Heifer Calf Under One Year.—First, Goldie's Jewel, Tebo Land & Cattle Co.; second, Fair Louisiana, Tebo Land & Cattle Co.; third, Clarabelle, Tebo Land & Cattle Co.; fourth, Edelweiss, G. H. Burgh; fifth, Marshal's Princess, Michael A. Wagner, sixth; Violet Maiden second, R. E. Watts & Sons.

Exhibitor's Herd.—First, Tebo Land & Cattle Co.; second, F. W. Harding; third, G. H. Burgh; fourth, Michael A. Wagner; fifth, F. A. Edwards.

Breeder's Young Herd.—First, Tebo Land & Cattle Co.; second, F. W. Harding; third, N. A. Lind; fourth G. H. Burgh; fifth, R. E. Watts & Son.

Calf Herd.—First, Tebo Land & &Cattle Co.; second N. A. Lind; third, F. W. Harding.

Get of Sire.—First and second, Tebo Land & Cattle Co.; third, N. A. Lind; fourth, G. H. Burgh; fifth, Michael A. Wagner.

Produce of Cow.—First and second, Tebo Land & Cattle Co.; third, E. R. Stangland; fourth, Michael A. Wagner; fifth, N. A. Lind.

Sweepstakes. Bull, any age.—First, F. W. Harding.

Sweepstakes. Cow, any age.—First, Tebo Land & Cattle Co.

IOWA SPECIALS.

Exhibitors must reside in the state; and cattle shown owned and kept in Iowa. First and second money winners in open classes, should they be Iowa cattle, barred from showing or drawing premiums in this class.

Bull Three Years or Over.—First, Double Gloster 2nd, 138588, R. E. Watts & Sons; second, Robin Adair, 151303, E. C. Sage; third, Cumberlain Banner Bearer, 167064, C. R. Warren.

Bull Two Years old and Under Three.—First, Sunrise, 224242, J. B. Brown; second, Secret Viscount, F. A. Edwards; third, Prince of Marathon, E. R. Stangland.

Bull One Year and Under Two.—First, Lord Raglan, 233051, B. E. Mitchell; second, Sidelight, 224241, J. B. Brown; third, King Victor, 239686, F. W. Akers; fourth, Challenger, R. E. Watts & Sons; fifth, Silver Crown, 240328, E. C. Holland.

Bull Calf Under One Year.—First, Gloster's Knight, R. E. Watts & Sons; second, Scottish Admiral, 242503, W E. Graham; third, Banner's Victor, 242584, C. R. Warren; fourth, First Choice, 212659, N. A. Lind; Fifth, King of Pine Grove, R. W. Livingston.

Cow Three Years Old or Over.—First, Jeanette B., Vol. 50, G. H. Burgh; second, Fair Duchess (Imp. Vol. 47, F. A. Edwards; third, Mary Rose, C. R. Waren; fourth, Pluma, Conway, Carey and Raffenberg.

Heifer Two Years and Under Three.—First, Fenimore Princess, Vol. 60, F. A. Edwards; second, Countess of Wayside, Vol. 60, G. H. Burge; third, Pleasant Hill Duchess, Vol. 61, E. R. Stangland; fourth, Inez Cumberlain, C. A. Saunders; fifth, Augusta Lulu, Vol. 61, C. W. McDermott.

Heifer One Year and Under Two.—First, Florodora, Vol. 60, G. H. Burgh; second, Daisy third, Vol. 60, R. E. Watts & Sons; third, Pleasant Hill Duchess second, Vol. 61, E. R. Strangland; fourth, Roan Queen, Vol. 64 N. A. Lind; fifth, Lavender Rose, F. A Edwards.

Heifer Calf Under One Year.—First, Edilweiss G. H. Burgh; second, Violet Maiden 2nd, R. E. Watts & Son; third, Rose of Autumn, Vol. 64, N. A. Lind; fourth Lovely Belle, Vol. 64, N A. Lind; fifth, Daisy fourth, R. E. Watts & Sons.

Exhibitors Herd.—First, G. W. Burge; second, F. A. Edwards, third, E. R. Stangland.

Breeders Young Herd.—First, N A Lind; second, G. H. Burge; third, R. E. Watts & Sons.

Get of Sire.—First, N. A. Lind; second, G H. Burge; third, R. E. Watts & sons.

Produce of Cow.—First, E. R. Stangland; Second and Third, N. A. Lind.

Sweepstakes, Bull Any Age.—R. E. Watts & Son.

Sweepstakes, Cow any age.—F. A. Edwards.

HEREFORDS.

EXHIBITORS.

H. Beckwith (Estate), Mt. Pleasant, Iowa; J. W. Blackford, Hillsboro, Iowa; S. L. Brock, Macon, Missouri; W. H. Curtice, Eminence, Kentucky; James A. Funkhouser, Plattsburg, Missouri; Benton Gabbart & Son, Dearborn, Missouri; S. J. Gabbart, Dearborn, Missouri; Cargill & McMillan, La Crosse, Wisconsin; Z. T.Kinsell, Mt. Ayr, Iowa; Mousel Bros., Richland, Kansas; David W. Ohl, Iowa City, Iowa; Steele Bros., Richland, Kansas; Steward & Hutcheon, Blockow, Missouri; W. S. Van Natta & Son, Fowler, Indiana.

AWARDS.

Judge ....Prof. C. F. Curtiss, Ames, Iowa.

Bull Three Years or Over.—First, Prince Rupert eighth,142701, W. H. Curtice; Second, Donald March On, 137719, W. S. Van Natta & Son; third, Fair Lad E, 167739, Cargill & McMillan; fourth, Beaumont, 134751, Steward & Hutcheon; Fifth, Columbus 53rd, 134101, S. J. Gabbert; Sixth, Fulfiller, 107722, Cargill & McMillan.

Bull Two Years and Under Three.—First, Onward 18th, 151572, James A. Funkhouser; second, Rare Lad, 160154, S. L. Brock; third, Princeps 8th, 165745, Steele Bros.; Fourth, Beau Donald, 58th, 162608, W. H. Curtice.

Bull One Year and Under Two.—First, Mapleton Beau, 189233, Steward & Hutcheon; second, Prime Lad third, 197984, W. S. Van Natta & Son; third, Heis A Columbus, 185545, S. J. Gabbart; fourth, Onward 31st, 187476, James A. Funkhouser; fifth, Privatier 2d, 182133, Cargill & McMillan; sixth, Columbus F., 172966, Benton Gabbart & Son.

Bull Calf Under One Year.—First, Bonnie Brae 3d, 203317, Cargill & McMillan; Second, Prime Lad 9th, 213963, W. S. Van Natta & Son; third, Onward 42d, 201286, James A. Funkhouser; fourth, Magnet, 207314, Steward & Hutcheon; Fifth, Prime Lad 16th, 213969, W. S. Van Natta & Son; Sixth, Parsifal, 206826, Steward & Hutcheon.

Cow Three Years or Over.—First, Heliotrope, 159451, Cargill & McMillan; second, Lorna Doone, 94479, W. S. Van Natta & Son; third, Belle Donald 60th, 142696, W. H. Curtice; fourth, Pricilla 5th, 129538, Steward & Hutcheon; fifth, Twila, 14945 Jas. A. Funkhouser; sixth, Belle Donald 44th, 109865, W. H. Curtice.

Heifer Two Years and Under Three.—First, Kathleen, 162587, Jas. A. Funkhouser; Second, Armenta 4th, 159982, Cargill & McMillan; Third, Miss Donald 3rd, 159996, Cargill & McMillan; Fourth, Lady March On, 173022, W. S. Van Natta & Son; Fifth, Nutbrown 9th, 188681, Steele Bros.; sixth, Mayflower, 170487, Steward & Hutcheon.

Heifer One Year and Under Two.—First, Purple Leaf 2d, 179248, Cargill & McMillan; Second, Belle Danold 85th, 187346, W. H. Curtice; Third, Golden Lassie, 182126, Cargill & McMillan; Fourth, Miss Donald 17th. 185673, Cargill & McMillan; Fifth, Lorna Lass, 187560, W. S. Van Natta && Son; Sixth, Bendena, 178848, Jas. A. Funkhouser.

Heifer Calf Under One Year.—First, Estel 2nd, 203107, Cargill & McMillan: Second, Lady Valeria, 204813, S. L. Brock: Third, Genevra, 201265, Jas. A. Funkhouser; Fourth, Pretty Face, 207319, Steward & Hutcheon; Fifth, Brownie Lass, 213953, W. S. Van Natta & Son; sixth, Belle Donald 93d, 212787, W. H. Curtice.

Exhibitors Herd.—First Cargill & McMillan, second, W. S. Van Natta & Son: third, Jas. A. Funkhouser; fourth, W. H. Curtice; fifth, Steward & Hutcheon.

Breeders Young Herd.—First, James A. Funkhouser; second, Cargill & McMillan: Third, W. S. Van Natta & Son: Fourth, Steward & Hutcheon; Fifth, Steele Bros.

Calf Herd.—First, W. S. Van Natta & Son; second, Jas. A. Funkhouser; third, S. L. Brock: fourth, Cargill & McMillan; fifth, Steward & Hutcheon.

Get of Sire.—First, Jas. A. Funkhouser: Second, W. H. Curtice; Third, S. L. Brock: Fourth, Cargill & McMillan: Fifth, W. S. Van Natta & Son.

Produce of Cow.—First, Jas. A. Funkhouser; Second, W. S. Van Natta & Son: Third, W. H. Curtice: Fourth, Jas. A. Funkhouser; Fifth, S. L. Brock.

Sweepstakes.—Bull any age.—First, W. H. Curtice.

Sweepstakes.—Cow any age.—First, Jas. A. Funkhouser.

IOWA SPECIALS.

Exhibitors must reside in the state, and cattle shown, owned and kept in Iowa. First and second money winners in open classes, should they be Iowa cattle, barred from showing or drawing premiums in this class.

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Bull Three Years Old or Over.—First, Bovie 3d, 115511, David W. Ohl.

Bull One Year Old and Under Two.—First, Advancer 10th, 189282, Z. T. Kinsell; Second, Beau Royal, 176745, David W. Ohl.

Bull Calf Under One Year.—First, Tige, 203963, David W. Ohl: Second, McKinley 6th, Z. T. Kinsell: third, Randolph, J. W. Blackford, Fourth, Rubicon, J. W. Blackford: Fifth, Rattler, J. W. Blackford.

Cow Three Years Old or Over.—First, Dora Thorne, 118061, David W. Ohl.

Heifer Two Years and Under Three.—First, Rosemond, Z. T. Kinsell; Second, Jessie 6th, Z. T. Kinsell; Third, Alice, 156316, David W .Ohl.

Heifer One Year and Under Two.—First, Maud 4th, Z. T. Kinsell; Second, Daisy K., Z. T. Kinsell: Third, Stella May, 176762, David W. Ohl: fourth, Beauty 2d, 202823, J. W. Blackford: fifth, Jessie 7th, Z. T. Kinsell.

Heifer Calf Under One Year.—First, Graceful 2d, Z.. T Kinsell; Second, Lady Advancer, Z. T. Kinsell: Third, Miss Advancer, Z. T. Kinsell: fourth, Lady Hawthorne, 203900, David W. Ohl; fifth, Wiltonia, 203908, David W. Ohl.

Exhibitors Herd.—First, David W. Ohl.

Breeders Young Herd.—First, Z. T. Kinsell; Second, David W. Ohl.

Get of Sire.—First, Z. T. Kinsell.

Produce of Cow.—First, Z. T. Kinsell; Second and Third, David W. Ohl.

Sweepstakes, Bull any age.—First, David W. Ohl.

Sweepstakes, Cow any age.—First, Z. T. Kinsell.

ABERDEEN-ANGUS.

EXHIBITORS.

Louie Aillaud, Newton, Iowa; O. V. Battle, Maquoketa, Iowa; A. C. Binnie, Alta, Iowa; E. T. Davis, Iowa City, Iowa; J. A. Ewing, Malcom, Iowa; B. F. Fantz, Nevada, Iowa; Oliver Hammers, Malvern, Iowa; W. S. Kelly, Mondamin, Iowa; M. P. and S. E. Lantz, Carlock, Illinois; C. J. Martin, Churdan, Iowa; Phil C. McDonald, Jr., Princeton, Missouri; W. A. McHenry, Denison, Iowa; W. J. Miller, Metz, Iowa; Chas. J. Off, Peoria, Illinois; J. B. Withers, Missouri City, Missouri.

AWARDS.

Judge..................................A. A. Armstrong, Camargo, Ill.

Bull Three Years Old or Over.—First, Prince Ito 2d, 54471, C. J. Martin; second, Zaire the Great, 49792, M. P. and S. E. Lautz; third, Censor, 53882, W. A. McHenry; Fourth, Erroline's Rosegay, 49769, J. B. Withers; fifth, Sir Novice, 49775, W. J. Miller; sixth Plumer, 41321, Oliver Hammers.

Bull Two Years and Under Three.—First, Marone, 63326, E. T. Davis; Second, Baden Lad, 61883, W. A. McHenry; Third, Monarch's Eric, 68274, M. P. & S. E. Lantz; Fourth, Pride of Peoria, 66566, Chas. J. Off.

Bull One Year and Under Two.—First, McDonald's Lad, 66952, E. T. Davis; Second, Rosegay Lad, 70259, C. J. Martin; Third, Choice Goods, 71671, W. A. McHenry; Fourth, Postscript of Alta, 73101, A. C. Binnie; Fifth, Brookside Fame, 73640, O. V. Battles; Sixth, Newton King, 73298, Louie Aillaud.

Bull Calf Under One Year.—First, Newton King Dodo, 81603, Louie Aillaud; second, Star of Denison 82426, W. A. McHenry, third, Quester Lad, A. C. Binnie; Fourth, Bluegrass Ridge Ajax, 76732, J. B. Withers; Fifth, Elm Lake, W. S. Kelley; Sixth, King Ito, 75683, C. J. Martin.

Cow Three Years Old or Over.—First, Blackbird 26th, 54457, C. J. Martin; second, Blackbird Favorite 2d, 59234, E. T. Davis; third Blackbird 24th, 44725, C. J. Martin; Fourth, Blackbird of Denison 31st, 38949, E. T. Davis; Fifth, Blackbird McHenry 13th, 23942, W. A. McHenry; sixth, Pride of Willowlawn, 39614, M. P. & S. E. Lantz.

Heifer Two Years and Under Three.—First, Glenfoil Rose, 63489, E. T. Davis; Second, Abbess McHenry 5th, 61875, W. A. McHenry; Third, Black Cap 22d 64114, C. J. Martin; fourth, Zara 26th, 68275, M. P. & S. E. Lantz; fifth, Coquette McHenry 30th, 61880, O. V. Battles; sixth, Metz Wanda 3d, 64132, W. J. Miller.

Heifer One Year and Under Two.—First, Eileen Lass, 73102, A. C. Binnie; Second, Marguerite D., 72307, E. T. Davis; Third, Augusta Pet, 77268, E. T. Davis; Fourth, Barbara McHenry 18th, 71677, W. A. McHenry; fifth, Prizetta, 72306, E. T. Davis; sixth, Hesterbloom 2d, 68992, M. P. & S. E. Lantz.

Heifer Calf Under One Year.—First, Pride McHenry 45th, 82421, W. A. McHenry; Second, Panora, 82906, E. T. Davis; Third, Abbess McHenry 6th, 82418, W. A. McHenry; Fourth, Beatrix Ito, 74818, C. J. Martin; Fifth, Queen of Cherokee 10th, 83078, E. T. Davis; Sixth, Blackbird Lassie, A. C. Binnie.

Exhibitors Herd.—First, E. T. Davis; Second, C. J. Martin; Third, W. A. McHenry; fourth M. P. & S. E. Lantz; fifth, J. B. Withers, Sixth, W. J. Miller.

Breeders Young Herd.—First, E. T. Davis; Second, W. A. McHenry; Third, A. C. Binnie; Fourth, C. J. Martin; Fifth, M. P. & S. E. Lautz.

Calf Herd.—First, W. A. McHenry; Second, C. J. Martin; Third, J. B. Withers.

Get or Sire.—First, C. J. Martin; Second, W. A. McHenry; Third, A. C. Binnie; fourth, M. P. & S. E Lantz; fifth, J, .B. Withers.

Produce of Cow.—First, E. T. Davis; Second, C. J. Martin; Third, M. P. & S. E. Lantz; fourth, W. A. McHenry; fifth, Louie Aillaud.

Sweepstakes, Bull any age.—First, C. J. Martin.

Sweepstakes, Cow any age.—First, J. B. Withers.

IOWA SPECIALS.

Exhibitors must reside in the state, and cattle shown, owned and kept in Iowa. First and second money winners in open classes, should they be Iowa cattle, barred from showing or drawing premiums in this class.

***Bull** Three Years or Over.*—First, Censor, 53882, W. A. McHenry; second, Sir Novice, 49775, W. J. Miller; third, Plumer, 41321, Oliver Hammers.

Bull One Year and Under Two.—First, Choice Goods, 71671, W. A. McHenry; Second, Postscript of Alta, 73101, A. C. Binnie; Third, Brookside Fame, 73640, O. V. Battles; Fourth, Newton King, 73298, Louie Aillaud; fifth, Captain of Mt. Vernon, 77567, Oliver Hammers.

Bull Calf Under One Year.—First, Quester Lad, A. C. Binnie; second, Elm Lake, W. S. Kelley; Third, King Ito, 75683, C. J. Martin; fourth, Melito, 74820, C. J. Martin; fifth, Bayor Ito, 78425, C. J. Martin.

Cow Three Years Old or Over.—First, Blackbird, 24th, 44725, C. J. Martin; Second, Blackbird of Denison 31st, 38949, E. T. Davis; Third, Blackbird McHenry 13th, 23942, W. A. McHenry; fourth, Snowflake 2d of Kirkridge, 64016, W. J. Miller; Fifth, Gay Rose Princess, 46163, W. J. Miller.

Heifer Two Years and Under Three.—First, Black Cap 22d, 64114, C. J. Martin; second, Coquette McHenry 30th, 61880, O. V. Battles; third, Metz Wanda 3d, 64132, W. J. Miller; fourth, Dorothy Nevada, 63384, B. F. Fantz.

Heifer One Year and Under Two.—First, Augusta Pet, 77268, E. T. Davis; Second, Barbara McHenry 18th, 71677, W. A. McHenry; Third, Prizetta, 72306, E. T. Davis; Fourth, Mina of Alta 5th, 73111, A. C. Binnie; Fifth, Blackbird 30th, 71697, C. J. Martin.

Heifer Calf Under One Year.—First, Abbess McHenry 6th, 82418, W. A. McHenry; Second, Beatrix Ito, 74818, C. J. Martin; Third, Queen of Cherokee 10th, 83078, E. T. Davis; Fourth, Blackbird Lassie, A. C. Binnie; Fifth, Barbara McHenry 20th, 82412, W. A. McHenry.

Exhibitors Herd.—First, W. A. McHenry; Second, W. J. Miller.

Breeders Young Herd.—First, A. C. Binnie; Second, C. J. Martin.

Get of Sire.—First, A. C. Binnie.

Produce of Cow.—First, W. A. McHenry; second, Louie Ailland.

Sweepstakes, Bull any age.—First, W. A. McHenry.

Sweepstakes, Cow any age.—First, C. J. Martin.

GALLOWAY.

EXHIBITORS.

J. E. Bales & Son, Stockport, Iowa; Brookside Farm Co., Wayne, Indiana; W. M. Brown & Son, Carrolton, Missouri; G. W. Lindsay, Red Cloud, Nebraska; C. D. McPherson, Fairfield, Iowa; C. N. Moody, Atlanta, Missouri; C. B. Rowland, Rose Hill, Iowa.

AWARDS.

Judge ....Charles Gray, Chicago, Ill.

Bull Three Years Old or Over.—First, Pat Ryan of Red Cloud, 20038, G. W. Lindsay; second, Chief 2d of Stepford, 23513, W. M. Brown & Son; third, Scottish Chief 3d of Castlemilk, 21227, Brookside Farm Co., Fourth, Bobo, 17580, J. E. Bales & Son; fifth, Ronald, 2d of Thornhill, 19289, C. B. Rowland.

Bull Two Years and Under Three.—First, St. L. of Red Cloud, 29354, G. W. Lindsay.

Bull One Year and Under Two.—First, Canty Lad, 24714, J. E. Bales & Son; Second, Lochnager, 24288, Brookside Farm Co.; Third, Standard Royal, 24289, Brookside Farm Co.; fourth Tuff R., 25899, C. B. Rowland; Fifth, King 14th of Fairfield, 14285, C. D. McPherson; sixth, Keney Mac, 25743, C. N. Moody.

Bull Calf Under One Year.—First, Standard Favorite, 26550, Brookside Farm Co., Second, Royal McDoughal, J. E. Bales & Son; third, Camp F. of Brookside, 25493, Brookside Farm Co.; Fourth, His Eminence, 26896, W. M. Brown & Son; Fifth, Master of Fairfield, 26927, C. D. McPherson; Sixth, Miller B. of Red Cloud, G. W. Lindsay.

Cow Three Years Old or Over.—First, Evaline 2d of Avondale, 20124, C. N. Moody; second, Lady Harden 4th of Tarbeoch, 19070, Brookside Farm Co., Third, Prairie Queen, 16232, J. E. Bales & Son; Fourth, Darkness of Wavertree, 17097, C. B. Rowland; Fifth, Banes Queen DiDo, 17292, G. W. Lindsay; Sixth, Muscosa of White Farm, 18920, C. D. McPherson.

Heifer Two Years and Under Three.—First, Scottish Empress, 22715, Brookside Farm Co.; second, Grace of Wildwood, 22255, W. M. Brown & Son; Third, C. N. Moody; Fourth, Nellie of Fairfield, 23011, C. D. McPherson; Fifth, Sadonia of R. C., 23158, G. W. Lindsay; Sixth, Graceful A., 23088, J. E. Bales & Son.

Heifer One Year and Under Two.—First, Scottish Rosalind A., 23332, Brookside Farm Co.; Second, Betty Miller 4th, 24285, Brookside Farm Co.; Third, St. Louis to See, 23706, C. N. Moody; Fourth, Follow Moody, 24656, C. N. Moody; Fifth, Fidelin of C. H., 24210, G. W. Lindsay; Sixth, Anna Davids 5th, J. E. Bales & Son.

Heifer Calf Under One Year.—First, Eglantine, 26860, W. M. Brown & Son; Second, Roselind Belle, 25186, Brookside Farm Co.; Third, Miss Portland, 25741, C. N. Moody; Fourth, Mollie C. of R. C., 26239, G. W. Lindsay; Fifth, Fan-Tan, 25488, Brockside Farm Co.; Sixth, Judie's McDougal, J. E. Bales & Son.

Exhibitors Herd.—First, Brookside Farm Co.; Second, J. E. Bales & Son; Third, G. W. Lindsay; Fourth, C. B. Rowland.

Breeder's Young Herd.—First, Brookside Farm Co.; Second, J. E. Bales & Son; Third, C. B. Rowland; Fourth, G. W Lindsay; Fifth, C. D. McPherson.

Calf Herd.—First, Brookside Farm Co.; Second, C. D. McPherson.

Get of Sire.—First, Brookside Farm Co.; Second, W. M. Brown & Son; Third, C. N. Moody; Fourth, C. B. Rowland; Fifth and Sixth, C. D. McPherson.

Produce of Cow.—First, Brookside Farm Co.; Second, G. W. Lindsay; Third, C. N. Moody; Fourth, Brookside Farm Co.; Fifth, C. B. Rowland,

Sweepstakes, Bull any age.—First, G. W. Lindsay.

Sweepstakes, Cow any age.—First, C. N. Moody.

RED POLLED.

EXHIBITORS.

Adolph P. Arp, Eldridge, Iowa; Geo. B. Buck, Sunny Hill, Illinois; G. W. Coleman, Webster City, Iowa.

AWARDS.

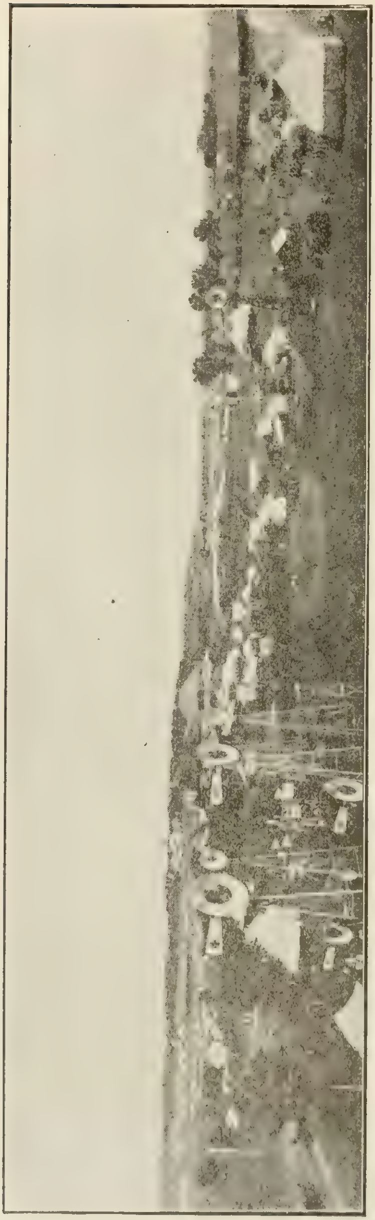
Judge ....T. J. Wornall, Liberty, Missouri.

Bull Three Years Old or Over.—First, Irwin, 8253, G. W. Coleman; Second, Nailer, 7396, Adolph P. Arp; Third, King George, 7279, Geo. B. Buck.

Bull Two Years and Under Three.—First, Field Marshall, 13959, Geo. B. Buck.

Bull One Year and Under Two.—First, Elmer, 13501, G. W. Coleman; Second, Thickset, 12321, Adolph P. Arp; Third, Dan, 13605, Geo. B. Buck.

Bull Calf Under One Year.—First, Logan, 13500, G. W. Coleman; Second, Silver King, 23518, G. W. Coleman; Third, Ranger, 13960, Geo. B. Buck; Fourth, Trouble, 13958, Geo. B. Buck; Fifth, Bouncer, 13965, Adolph P. Arp; Sixth, Governor Eldridge, 13967, Adolph P. Arp.



Where varied industry covers broad acres.

Cow Three Years Old or Over.—First, Chick, 24112, Geo. B. Buck; second, Lalae, 18480, Adolph P. Arp; third, Eva 3rd, 16592, Geo. B. Buck; Fourth, Tillie, 9020, G. W. Coleman; Fifth, Laura's Perfection, 19896, Adolph P. Arp; Sixth, Ada Lee, 19162, G. W. Coleman.

Heifer Two Years and Under Three.—First, Exmas 5th, 21160, Geo. B. Buck; Second, Bar Maid, 19225, G. W. Coleman; Third, Minnie Girl, 21680, G. W. Coleman; Fourth, Ruby Rose, 22524, Adolph P. Arp; Fifth, Laura's Perfection 2d, 21479, Adolph P. Arp.

Heifer One Year and Under Two.—First, Clara, 2933, Geo. B. Buck; Second, Wild Rose, 22223, G. W. Coleman; Third, Maud Lady, 24113, Geo. B. Buck; Fourth, Dollie 23509,G. W. Coleman; Fifth, Leola, 22525, Adolph P. Arp.; Sixth, Laura's Perfection 3d, 24125, Adolph P. Arp.

Heifer Calf Under One Year.—First, Red Bell, 24123, Geo. B. Buck; Second, Wild Rose 2d, 23519, G. W. Coleman; third, Maud's Baby, 24114, Geo. B. Buck; Fourth, Eunice, Vol. 18, G. W. Coleman; Fifth, Alma, Adolph P. Arp.; sixth, Laura's Perfection 4th, 24126, Adolph P. Arp.

Exhibitor's Herd.—First, Geo. B. Buck; Second, G. W. Coleman; Third, Adolph P. Arp.

Breeder's Young Herd.—First, Geo. B. Buck; Second, G. W. Coleman; Third, Adolph P. Arp.

Get of Sire.—First, G. W. Coleman; Second, Geo. B. Buck; Third, G. W. Coleman; Fourth and Fifth, Adolph P. Arp.

Produce of Cow.—First, Geo. B. Buck; Second and Third, G. W. Coleman; Fourth and Fifth, Adolph P. Arp.

Sweepstakes, Bull any age.—First, G. W. Coleman.

Sweepstakes, Cow any age.—First, Geo. B. Buck.

POLLED DURHAM.

EXHIBITORS.

H. W. Deuker, Wellman, Iowa; F. F. Failor, Newton, Iowa; L. G. Shaver, Kalona, Iowa; A. C. Wood & Son; Pendleton, Missouri.

AWARDS.

Judge ....T. J. Wornall, Liberty, Missouri.

Bull Three Years Old or Over.—First, Secret Knight, 2541, L. G. Shaver; second, Ottawa Gauntlet, Vol. 2, H. W. Deuker; third, Athenian Prince, 175571, F. F. Failor.

Bull Two Years and Under Three.—First, Orange King, 3242, A. C. Wood & Sons.

Bull One Year and Under Two.—First, Roan Hero, 3617, L. G. Shaver; second, Prince Rosabel, 233380, F. F. Failor.

Bull Calf Under One Year.—First, Prize Taker, Vol. 4, H. W. Deuker; Second, Crimson Prince, F. F. Failor; Third, Col. Perry, A. C. Wood & Sons; Fourth, Roan Secret, Vol. 4, L. G. Shaver; Fifth, Secret Knight 3d, Vol. 4, L. G. Shaver; sixth, Young Tip, Vol. 4, H. W. Deuker.

Cow Three Years Old or Over.—First, Emily Creggs 2d, Vol. 3, A. C. Wood & Sons; second, Royal Flora, Vol. 3, H. W. Deuker; third; Kalona Gloster, Vol. 3, L. G. Shaver; Fourth, Lady Craibstone, Vol. 54, F. F. Failor; Fifth, Orange Blossom of Hillsdale, Vol. 52, F. F. Failor.

Heifer Two Years and Under Three.—First, Pride's Princess, Vol. 3, A. C. Wood & Sons; Second, Queen Emma, Vol. 7, L. G. Shaver; Third, Scottish Bell 2d, Vol. 3, H. W. Deuker; fourth. Arcadia Ruby, Vol. 7, L. G. Shaver; Fifth, Lady Belle, Vol. 62, F. F. Failor.

Heifer One Year and Under Two.—First, Queen Mable, Vol. 4, L. G. Shaver; Second, Pride's Fancy, Vol. 3, A. C. Wood & Sons; Third, Hero Maid, Vol. 3, A. C. Wood & Sons; fourth, Scottish Bell 3d, Vol. 4, H. W. Deuker; fifth, Orange Lady 2d, Vol. 4, L. G. Shaver; sixth, Queen Vol. 4, H. W. Deuker.

Heifer Calf Under One Year.—First, Fairy Queen, A. C. Wood & Sons; second, Spotted Beauty, Vol. 4, H. W. Deuker; third, Secret Bell, Vol. 4, L. G. Shaver; Fourth, Victoria Lady, A. C. Wood & Sons; Fifth, Royal Queen, Vol. 4, L. G. Shaver; sixth, sunshine, Vol. 4, H. W. Deuker. ker.

Exhibitor's Herd.—First, A. C. Wood & Sons; Second, L. G. Shaver; third, H. W. Deuker; fourth, F. F. Failor.

Breeder's Young Herd.—First, L. G. Shaver; Second, A. C. Wood & Sons; third, H. W. Deuker; fourth, F. F. Failor.

Get of Sire.—First, A. C. Wood & Sons; Second, H. W. Deuker; Third, L. G. Shaver; Fourth, F. F. Failor.

Produce of Cow.—First, A. C. Wood & Sons; Second, L. G. Shaver; third, H. W. Deuker; fourth, F. F. Failor.

Sweepstakes, Bull any age.—First, L. G. Shaver.

Sweepstakes, Cow any age.—First, A. C. Wood & Sons.

HOLSTEIN.

EXHIBITORS.

W. B. Barney & Co., Hampton, Iowa; C. D. McPherson, Fairfield, Iowa; C. F. Stone, Peabody, Kansas; Wisconsin Live Stock Assn., Appleton, Wisconsin.

AWARDS.

Judge ....F. H. Scribner, Rosendale, Wisconsin.

Bull Three Years Old or Over.—First, Jewel of Home Farm, 24340, W. B. Barney & Co.; Second, Ethel Alexander 2d's Sir Netherland, 25423,, C. F. Stone; third, Sir Pauline Paul 2d's Colanthar, Vol. 24, Wisconsin Live Stock Assn.

Bull Two Years and Under Three.—First, Sir Pauline Colanthar, Vol. 24, Wisconsin Live Stock Assn.

Bull One Year and Under Two.—First, Larrie's Netherland Jewel, 38433, W. B. Barney & Co.; Second, Josephine Mechtchilde Sir De Kol, 35086, C. F. Stone; Third, Sir Colantha Laddie, 36452, W. B. Barney & Co.; Fourth, Beryl Wayne's Son No. 4, Vol. 23, Wisconsin Live Stock Assn.; Fifth, Sir Royal Korndyke Change, Vol. 22, Wisconsin Live Stock Assn.

Bull Calf Under One Year.—First, Lad Gerben, W. B. Barney & Co.; Second, Sir Korndyke, Hangeveld Paul De Kol, Vol. 22, Wisconsin Live Stock Assn.; Third, Sir Korndyke Paul De Kol, Vol. 22, Wisconsin Live Stock Assn.; Fourth, Owanda Gerben Jewel, W. B. Barney & Co.; Fifth, C. D. McPherson; Sixth, C. F. Stone.

Cow Three Years Old or Over.—First, Wayne Parthenea, 61773, C. F. Stone; Second, Parthenia Hengerveld, 46004, W. B. Barney & Co.; third,, Maryke 3d's Gerben 4th, 54935, C. F. Stone; fourth, Lady Josephine Aggie De Kol, 52454, W. B. Barney & Co., Fifth, 2d's De Kol Parthenia Pauline, Vol. 22, Wisconsin Live Stock Assn.

Heifer Two Years Old and Under Three.—First, Josephine Abbekirk De Kol 2d, 67655, W. B. Barney & Co.; second, Princess Pel Gerben, 63691, C. F. Stone; third, De Kol Parthenia 2d, Vol. 22, Wisconsin Live Stock Assn.; Fourth, Riji Colantha, 67656, W. B. Barney & Co.; fifth, Josephine Gerben 2d, Vol. 22, Wisconsin Live Stock Assn; sixth, Queen Josephine Mechtchilde 2d, 63690, C. F. Stone.

Heifer One Year Old and Under Two.—First, De Kol Parthenia Pauline 3d, Vol. 22, Wisconsin Live Stock Assn.; Second, Gerben Empress of Home Farm 3d, 71978, W. B. Barney & Co.; Third, Jewell De Kol Hangerveld 2d, Vol. 22, Wisconsin Live Stock Assn.; Fourth, Rose Gerben 72743, C. F. Stone; Fifth, Parthenea Gerben De Kol, 71140, C. F. Stone; Sixth, Princess Pel De Kol, 71141, C. F. Stone.

Heifer Calf Under One Year.—First, Jewell De Kol Hangerveld 3d, Vol. 22, Wisconsin Live Stock Assn.; Second, C. F. Stone; third, Josephine Abbekirk De Kol 4th, W. B. Barney & Co.; Fourth, K. Josephine De Kol Pauline, 3d Vol. 22, Wisconsin Live Stock Assn.; Fifth Lustend Belle Jeek 4th, W. B. Barney & Co.

Exhibitor's Herd.—First, W. B. Barney & Co.; Second, C. F. Stone; Third and Fourth, Wisconsin Live Stock Assn.

Breeder's Young Herd.—First, C. F. Stone; Second, W. B. Barney & Co.; third, Wisconsin Live Stock Assn.

Get of Sire.—First, C. F. Stone; Second, Wisconsin Live Stock Assn.; Third, W. B. Barney & Co.; Fourth, Wisconsin Live Stock Assn.; Fifth, W. B. Barney & Co.

Produce of Cow.—First, W. B. Barney & Co.; Second, Wisconsin Live Stock Assn.; Third, C. F. Stone; Fourth, W. B. Barney & Co.; Fifth, Wisconsin Live Stock Assn.

Sweepstakes, Bull any age.—First, W. B. Barney & Co.

Sweepstakes, Cow any age.—First, C. F. Stone.

JERSEYS.

EXHIBITORS.

W. S. Dixon, Brandon, Wisconsin; Hunter & Smith, Lincoln, Nebraska; C. D. McPherson, Fairfield, Iowa; George Redhead, Des Moines, Iowa; C. E. Still, Kirksville, Missouri; Mrs. S. B. Thomas, St. Joseph, Missouri; A. P Walker, Rushville, Indiana.

AWARDS.

Judge ....F. H. Scribner, Rosendale, Wisconsin.

Bull Three Years Old or Over.—First, Emanon, 52299, Hunter & Smith; Second, Imp. Brookhill Fox, 65303, C. E. Still; Third, Victoria's Champion Lad, 59197, Hunter & Smith; Fourth, Clara's Orphan, 61121, A. P. Walker; Fifth, Uncle Peter's Gold Mine, 57427, Mrs. S. B. Thomas; Sixth, Trustee Gylden, 70433, George S Redhead.

Bull Two Years and Under Three.—First, Vic's Success, 68163, Hunter & Smith; second, Lusy's Golder Fern, 68198, A. P. Walker.

Bull One Year and Under Two.—First, Exiles Gwenon Lad, 68135, Hunter & Smith; Second, Black Prince of Lancaster, Hunter & Smith; Third, Silverine's Lad, 68133, C. E. Still; Fourth, Rosebud's Fern Lad, 70045, A. P. Walker; Fifth, Uncle Peter's Combination, 68096, Mrs. S. B. Thomas.

Bull Calf Under One Year.—First, C. E. Still; Second, Jubilee's Carnation, 70047, A. P. Walker; Third, Catillion's Batchelor, Hunter & Smith; Fourth, Victoria's Shadeon, Hunter & Smith; Fifth, Dairymaid's Lad, 69434, C. E. Still; Sixth, Oakland Fox, 69435, C. E. Still.

Cow Three Years Old or Over.—First, Golden Fern's Tulip, 161059, A. P. Walker; Second, Baronette of Ingleside, 132057, C. E. Still; Third, Sultan Wonder, 168524, Hunter & Smith; Fourth, Boom's Nigretta, 116131, Mrs. S. B. Thomas; Fifth, Victoria's Rubano, 183114, Hunter & Smith.

Heifer Two Years and Under Three.—First, Blue Belle's Pretty Belle, 180295, C. E. Still; Second, Fern's Rowena, 188660, A. P. Walker; Third, Victoria's Pearline, Hunter & Smith; Fourth, Uncle Peter's Creampot, 183006, Mrs. S. B. Thomas; Fifth, Fern's Rosebud, 190421, A. P. Walker.

Heifer One Year and Under Two.—First, Lily's Carnation, 183288, A. P. Walker; Second, Victoria's Gypsy Gold, Hunter & Smith; Third, Uncle Peter's Dundas, 185998, Mrs. S. B. Thomas; Fourth, Silver Stella, 182973, C. E. Still; Fifth, Golden Rhyme, 188661, A. P. Walker; Sixth, Bachelor's Fluff, 190596, Hunter & Smith.

Heifer Calf Under One Year.—First, Victoria's Angelo Annie, Hunter & Smith; Second, Eminent's Brookhill, 190590, A. P. Walker; Third, Silverine's Lady Meg, C. E. Still; Fourth, Uncle Peter's Love, 190609, Mrs. S. B. Thomas; Fifth, Uncle Peter's Belle, 190608, Mrs. S. B. Thomas.

Exhibitor's Herd.—First, Hunter & Smith; Second, A. P. Walker; Third, C. E. Still; Fourth, Mrs. S. B. Thomas; Fifth, George S. Redhead.

Breeder's Young Herd.—First, Hunter & Smith; Second, A. P. Walker; Third, Mrs. S. B. Thomas; Fourth, C .E. Still; Fifth, George S. Redhead.

Get of Sire.—First, Hunter & Smith; Second, A. P. Walker; Third, Mrs. S. B. Thomas; Fourth, C. E. Still; Fifth, Mrs. S. B. Thomas.

Produce of Cow.—First, Mrs. S. B. Thomas; second, A. P. Walker; Third, Hunter & Smith; Fourth, Mrs. S. B. Thomas; Fifth, C. E. Still.

Sweepstakes, Bull any age.—First, Hunter & Smith.

Sweepstakes, Cow any age.—First, A. P. Walker.

TEST OF MILCH COWS.

EXHIBITORS.

W. B. Barney & Co., Hampton, Iowa; Hunter & Smith, Lincoln, Nebraska; C. D. McPherson, Fairfield, Iowa; George Redhead, Des Moines, Iowa; C. F. Stone, Peabody, Kansas.

AWARDS.

Judge ....C. Larsen, Ames, Ia.

Test of Milch Cows.—First, Lady Josephine Aggie De Kol, 54254, W. B. Barney && Co.; second, Parthenea Hangerveld, 46004, W. B. Barney & Co.; third, Trustee's Lizette, 161562, George S. Redhead, Des Moines, Ia.; Fourth, Daisy, George S. Redhead, Des Moines, Iowa.

FAT CATTLE—SHORT HORNS.

EXHIBITORS.

N. A. Lind, Rolfe, Iowa; J. R. Peak & Son, Winchester, Illinois; C. A. Saunders, Manilla, Iowa; Wm. Smiley, Malcom, Iowa.

AWARDS.

Judge ....Prof. C. F. Curtiss, Ames, Iowa.

Steer or Spayed Heifer, Two Years and Under Three.—First, Farmers Friend, C. A. Saunders; Second, Grant, J. R. Peak & Son; Third, General Togo, Wm. Smiley.

Steer or Spayed Heifer, One Year and Under Two.—First, J. R. Peak & Son; Second, Sun Ray, J. R. Peak & Son; Third, 2d Reformer, Wm. Smiley.

Steer or Spayed Heifer Under One Year.—First, Brampton's Choice, N. A. Lind; Second, Edgar, Wm. Smiley; Third, Bartee, J. R. Peak & Son.

Sweepstakes—Champion Steer or Spayed Heifer.—First, C. A. Saunders.

Champion Group.—First, J. R. Peak & Son; Second, Wm. Smiley,

FAT CATTLE—HEREFORDS.

EXHIBITORS.

S. L. Brock, Macon, Missouri; Cargill & McMillan, La Crosse, Wisconsin.

AWARDS.

Judge ....Prof. C. F. Curtiss, Ames, Iowa.

Steer or Spayed Heifer, Two Years and Under Three.—First, Silver Lad, S. L. Brock; Second, Burnsides, Cargill & McMillan.

Steer or Spayed Heifer, One Year and Under Two.—First, Puritan 2d. 182134, Cargill & McMillan; Second, Dispensor, S. L. Brock.

Steer or Spayed Heifer, Under One Year.—First, Fair Lad 1st, 203171, Cargill & McMillan; Second, Disclosure, S. L. Brock.

Sweepstakes, Champion Steer or Spayed Heifer.—First, Cargill & McMillan.

Champion Group.—First, Cargill & McMillan; Second, S. L. Brock.

FAT CATTLE—ABERDEEN-ANGUS.

EXHIBITORS.

A. C. Binnie, Alta, Iowa; M. P. & S. E. Lantz, Carlock, Illinois; W. J. Miller, Metz, Iowa; Chas. J. Off, Peoria, Illinois.

AWARDS.

Judge ....Prof. C. F. Curtiss, Ames, Iowa.

Steer or Spayed Heifer, Two Years and Under Three.—First, Plunket, 64705, M. P. & S. E. Lantz; Second, Driftwood, A. C. Binnie; Third, Wellington of Homedale, 64166, W. J. Miller.

Steer or Spayed Heifer, One Year and Under Two.—First, Cock Robin, A. C. Binnie; Second, Syberian, 68291, M. P. & S. E. Lantz; Third, Sunflower Advance, 1308, W. J. Miller.

Steer or Sprayed Heifer Under One Year.—First, Syberian 2d, 1364, M. P. & S. E. Lantz; Second, Prince, W. J. Miller; Third, Proud Fellow, Chas. J. Off.

Sweepstakes, Champion Steer or Spayed Heifer.—First, M. P. & S. E. Lantz.

Champion Group.—First, M. P. & S. E. Lantz; Second, A. C. Binnie; Third, W. J. Miller.

FAT CATTLE—GALLOWAYS.

EXHIBITORS.

C. N. Moody, Atlanta, Missouri; C. D. McPherson, Fairfield, Iowa.

AWARDS.

Judge ....Prof. C. F. Curtiss, Ames, Iowa.

Steer or Spayed Heifer, Two Years and Under Three.—First, C. D. McPherson.

Steer or Spayed Heifer, One Year and Under Two.—Third, C. D. McPherson.

Steer or Spayed Heifer Under One Year.—Second, C. D. McPherson.

Champion Group.—Second, C. D. McPherson.

FAT CATTLE—GRADES AND CROSS BREEDS.

EXHIBITORS.

W. M. Brown & Son, Carrollton, Missouri; S. L. Brock, Macon, Missouri; S. J. Gabbert, Dearborn, Missouri; J. A. Ewing, Malcom, Iowa; Z. T. Kinsell, Mt. Ayr, Iowa; C. Krambeck, Marne, Iowa; N. A. Lind, Rolfe, Iowa; W. J. Miller, Metz, Iowa; C. N. Moody, Atlanta, Missouri; C. D. McPherson, Fairfield, Iowa; J. R. Peak & Son, Winchester, Illinois; Wm. Smiley, Malcom, Iowa.

AWARDS.

Judge ....Prof. C. F. Curtiss, Ames, Iowa.

Steer or Spayed Heifer, Two Years and Under Three.—First, McHenry, C. Krambeck; Second, Adkins S. J. R. Peak & Son; Third, Wild Tom, W. J. Miller.

Steer or Spayed Heifer, One Year and Under Two.—First, Scotch High Ball, S. L. Brock; Second, Arc Light, Wm. Smiley; Third, Jimmie, W. J. Miller.

Steer or Spayed Heifer Under One Year.—First, Black Prince, W. J. Miller; Second, Black Victor, W. J. Miller; Third, Barter, J. R. Peak & Son.

Sweepstakes, Champion Steer or Spayed Heifer.—First, S. L. Brock.

Champion Group.—First and Second, W. J. Miller; Third, J. R. Peak & Son.

Grand Champion.—Steer or spayed heifer, any age or breed, limited to the sweepstakes or champion steers or spayed heifers winning in the pure-bred Short-Horn, Hereford, Aberdeen Angus, Galloways and the grades and cross-bred sections.

Awarded to M. P. & S. E. Lantz, on Plunkit, 64705.

Grand Champion Group.—Grand champion group of three steers or spayed heifers, consisting of one steer or spayed heifer, 2 years and under 3, one 1 year and under 2, and 1 under 1 year, owned by one exhibitor, competition limited to the champion group of the Short-Horn, Hereford, Aberdeen Angus, Galloway and grades or cross breeds.

Awarded to Cargill & McMillan.

Grand Beef Herd.—Best breeding herd of pure bred cattle of any distinct beef breed, consisting of one bull 2 years old or over, one cow 3 years old, one heifer 2 years old and under 3, one heifer 1 year old and under 2, one heifer 1 year old, belonging to one individual or firm.

Awarded to Cargill & McMillan, on Herefords.

SWINE DEPARTMENT.

Superintendent .... R. S. Johnston, Columbus Junction, Iowa.

POLAND CHINA.

EXHIBITORS.

F. W. Akers, Laurel, Iowa; E. Alphonso, Harper, Iowa; W. S. Babcock, Rockwell City, Iowa; M. W. Bateman, Monroe, Iowa; F. B. Bishop, Whitewater, Wisconsin; W. M. Black, Knoxville, Iowa; J. W. Blackford, Hillsboro, Iowa; Henry Bowans, Monroe, Iowa; H. G. Boyer, Lovilla, Iowa; Boyer & Chiles, Lovilla and Fairfield, Iowa; F. L. Brumbach, Cissna Park, Illinois; Ira E. Bryan, Ohio, Illinois; F. L. Bunton, West Union, Iowa; S. P. Chiles, Fairfield, Iowa; Wm. Crownover, Hudson, Iowa; J. I. Davis, Mt. Hamill, Iowa; Dietrich & Spaulding, Richmond, Kansas; M. A. Dowling, Newton, Iowa; C. H. Drake, Stockport, Iowa; J. R. Eblin & Sons, Massena, Iowa; J. S. Faucett, Springdale, Iowa; J. A. Fiderlein, Atalissa, Iowa; John Frances & Son, New Lenox, Illinois; J. P. Freeman, Hazleton, Iowa; J. D. Gates, Ravenwood, Missouri; John H. Gibbons, North English, Iowa; B. L. Gosick, Fairfield, Iowa; G. R. Hall & Son, Iowa City, Iowa; J. C. Hanna, Burlington, Iowa; Hanson, Black & Gaffey, Holbrook, Iowa; Hays & Bradley, Wyanet, Illinois; W. H. Harrison, Wright, Iowa; H. C. Hanson, Vermillion, South Dakota; Geo. W. Heaton, Wyanet, Illinois; Geo. A. Heyl, Washington, Illinois; Ed. Holmes, Bedford, Iowa; Hoover & Sons, Oskaloosa, Iowa; V. O. Hunt, Ravenwood, Missouri; M. Hummel, Monroe, Iowa; L. Hunsberger, Elgin, Iowa; W. A. Jones, Van Meter, Iowa; Harvey Johnson, Logan, Iowa; Johnson & McKelvie, Logan, Iowa and Lincoln, Nebraska; C. F. Kelling, Avon, Iowa; F. D. Kenworthy, Avon, Iowa; D. L. Kent, Jewell, Iowa; N. J. Kent, Jewell, Iowa; Wm. Kirk, Logan, Iowa; U. C. Lake, Muscatine, Iowa; John B. Lanson, Norwich, Iowa; J. V. Lingenfelter, Altoona, Iowa; W. C. Lookingbill, Sac City, Iowa; Lock & Wellington, Remington, Indiana; A. J. Lytle, Oskaloosa, Iowa; G. F. Marshall, Monroe, Iowa; J. A. Mason, Carlisle, Iowa; E. M. Metzgar, Fairfield, Iowa; John F. Meyer, Newton, Iowa; Moon & Brown, Clinton, Iowa; S. H. Moore, Monroe, Iowa; A. A. McFerrin, Blanchard, Iowa; S. R. McLaughlin, West Liberty, Iowa; May & Porter, Remington, Indiana; F. N. Orr, Albia, Iowa; Pease & Pinck, Colfax, Iowa; Wm. Pedrick

& Son, Ottumwa, Iowa; O. R. Phelps, Taintor, Iowa; A. J. Podendorf, Logan, Iowa; J. F. Pierce, Avoca, Iowa; George H. Preston, West Branch, Iowa; Roy W. Rockwell, Paullina, Iowa; A. Schwaller, Burlington, Iowa; F. H. Shellabarger, West Liberty, Iowa; Shannon & Book Bros., Storm Lake, Iowa; C. A. Steele, Ogden, Iowa; G. W. Stout, Rose Hill, Iowa; W. G. Stevenson, Knoxville, Iowa; Mark I. Shaw, Monroe, Iowa; Chas. H. Stone, Muscatine, Iowa; Strater Bros., Monroe, Iowa; W. Z. Swallow & Sons, Waukee, Iowa; W. H. Swiney, Webster City, Iowa; Dr. W. F. Reynolds, El Dora, Illinois; Robert Taylor ,Abbott, Nebraska; Mrs. S. B. Thomas, St. Joseph, Missouri; R. G. Tweed, La Grande, Iowa; J. H. Watson, Madrid, Iowa; Geo. H. White, Emerson, Iowa; Frank Wolgamuth, Elgin, Illinois; B. T. Wray & Sons, Hopkins, Missouri; W. G. Tittsworth, Avoca, Iowa.

AWARDS.

Judge ....F. M. Lail, Marshall, Missouri.

Boar Two Years Old or Over.—First, Ira E. Bryan; Second, J. A. Fiderlein; Third, Geo. H. White; Fourth, J. C. Hanna; Fifth, Dietrich & Spaulding; Sixth, B. L. Gosick; Seventh, Roy W. Rockwell.

Boar Eighteen Months and Under Two Years.—First, Frank Wolgamuth; Second, Hanson, Black & Goffey; Third, Lock & Wellington; Fourth, E. M. Metzgar; Fifth, F. L. Bunton; Sixth, J. D. Gates; Seventh, W. C. Lookingbill.

Boar One Year and Under Eighteen Months.—First, W. H. Swiney; Second, W. A. Jones; Third, John B. Lanson; Fourth, J. V. Lingenfelter; Fifth, E. M. Metzgar; Sixth, Shannon & Book Bros.; Seventh, Johnson & McKelvie.

Boar Six Months and Under One Year.—First, F. L. Brumbach; Second, H. G. Boyer; Third, A. A. McFerrin; Fourth, Geo. H. White; Fifth, J. A. Mason; Sixth, Dr. W. F. Reynolds; Seventh, Lock & Wellington.

Boar Under Six Months.—First, A. Schwaller; Second, S. P. Chiles; Third, W. Z. Swallow & Son; Fourth, H. G. Boyer; Fifth, Jno. Francis & Son; Sixth, Wm. Kirk; Seventh, W. H. Swiney.

Sow Two Years or Over.—First, Jno. Francis & Son; Second, W. Z. Swallow & Sons; Third, Ira E. Bryan; Fourth, A. J. Podendorf; Fifth, Jno. Francis & Son; Sixth, Geo. H. White; Seventh, W. C. Lookingbill.

Sow Eighteen Months and Under Two Years.—First, A. A. McFerrin; Second, E. M. Metzgar; Third and Fourth, Lock & Wellington; Fifth, A. J. Podendorf; Sixth, Jno. Francis & Son; Seventh, Lock & Wellington.

Sow One Year and Under Eighteen Months.—First, W. H. Swiney; Second and Third, Jno. Francis & Son; Fourth and Fifth, E. M. Metzgar; Sixth, W. H. Swiney; Seventh, Hanson, Black & Goffey.

Sow Six Months and Under One Year.—First, S. P. Chiles; Second, A. A. McFerrin; Third and Fourth, S. P. Chiles; Fifth, Jno. Francis & Son; Sixth, Frank Wolgamuth; Seventh, A. J. Podendorf.

Sow Under Six Months.—First, Geo. W. Heaton; Second, A. J. Podendorf; third, L. Hunsberger; fourth, S. P. Chiles; fifth, Mark I. Shaw; Sixth, H. G. Boyer; Seventh, Jno. Francis & Son. .

Boar and Three Sows Over One Year.—First, W. H. Swiney; Second, E. M. Metzgar; Third, Lock & Wellington; Fourth, Hanson Black & Goffey; Fifth, Jno. Francis & Son; Sixth, Geo. H. White; Seventh, A. J. Podendorf.

Boar and Three Sows Under One Year.—First, S. P. Chiles; Second, A. A. McFerrin; Third, W. Z. Swallow & Sons; Fourth, Geo. H. White; Fifth, Lock & Wellington; Sixth, Jno. Francis & Son; Seventh, Ira E Bryan.

Boar and Three Sows Over One Year, Bred by Exhibitor.—First, E. M. Metzgar; Second, Lock & Wellington; Third, Jno. Francis & Son; Fourth, W. A. Jones; Fifth, A. J. Podendorf; Sixth, Harvey Johnson; Seventh, O. R. Phelps.

Boar and Three Sows Under One Year, Bred by Exhibitor.—First, S. P. Chiles; Second, A. A McFerrin; Third, W. Z Swallow & Sons; Fourth, Geo. H. White; Fifth, Lock & Wellington; Sixth, Jno. Francis & Son; Seventh, Ira E. Bryan.

Get of Sire.—First, Jno. Francis & Son; Second, E. M. Metzgar; Third, S. P. Chiles; Fourth, Lock & Wellington; Fifth, A. A. McFerrin; Sixth, A. J. Podendorf; Seventh, Harvey Johnson.

Produce of Sow.—First, Hays & Bradley; Second, H. G. Boyer; Third, Geo. W. Heaton; Fourth, Jno. Francis & Son; Fifth, W. H. Swiney; Sixth, W. Z. Swallow & Sons; Seventh, E. M. Metzgar.

Sweepstakes, Boar any age.—Frank Wolgymuth.

Sweepstakes, Sow any age.—Jno. Francis & son.

Sweepstakes, Boar any age, Bred by Exhibitor.—F. L. Brumbach.

Sweepstakes, Sow any age, Bred by Exhibitor.—Jno. Francis & Son. Son.

BERKSHIRE.

EXHIBITORS.

C. F. Cassady & Sons, Denison, Iowa; Etzler & Moses, Decatur, Indiana; W. R. Holt, Fall City, Nebraska; C. D. Johnson, Nashua, Iowa; John B. Lanson, Norwich, Iowa; T. W. Miller, Menlo, Iowa; Thos. Teal & Son, Stockport, Iowa.

AWARDS.

Judge ....W. Z. Swallow, Waukee, Iowa.

Boar Two Years or Over.—First, Etzler & Moses; Second, T. W. Miller; Third, C. D. Johnson.

Boar Eighteen Months and Under Two Years.—First and Second, C. D. Johnson.

Boar One Year and Under Eighteen Months.—First, W. R. Holt; Second, C. D. Johnson; Third, Etzler & Moses.

Boar Six Months and Under One Year.—First, Etzler & Moses; Second, W. R. Holt; Third, C. D. Johnson; Fourth, W. R. Holt; Fifth and Sixth, Etzler & Moses; Seventh, T. W. Miller.

Boar Under Six Months.—First, Etzler & Moses; Second and Third, T. W. Miller; Fourth and Fifth, C. F. Cassady & Sons; Sixth, T. W. Miller; Seventh, Thos. Teal & Son.

Sow Two Years or Over.—First, W. R. Holt; Second, C. F. Cassady & Sons; Third, W. R. Holt; Fourth, C. D. Johnson; Fifth, Etzler & Moses.

Sow Eighteen Months and Under Two Years.—First, Etzler & Moses; Second and Third, W. R. Holt; Fourth, C. D. Johnson; Fifth, C. F. Cassady & Sons; Sixth, C. D. Johnson.

Sow One Year and Under Eighteen Months.—First, Etzler & Moses; Second and Third, W. R. Holt; Fourth and Fifth, C. D. Johnson.

Sow Six Months and Under One Year.—First, W. R. Holt; Second, Third and Fourth, Etzler & Moses; Fifth, C. D. Johnson; Sixth, W. R. Holt; Seventh, C. F. Cassady & Sons

Sow Under Six Months.—First, Etzler & Moses; Second Third, Fourth and Fifth, T. W. Miller; Sixth, Etzler & Moses; Seventh, C. F. Cassady, & Sons.

Boar and Three Sows Over One Year.—First, Etzler & Moses; Second, W. R. Holt; Third, C. D. Johnson.

Boar and Three Sows Under One Year.—First, Etzler & Moses; Second, W. R. Holt; Third, T. W. Miller; Fourth, C. D. Johnson; Fifth, C. F. Cassady & Sons.

Boar and Three Sows Over One Year, Bred by Exhibitor.—First, W. R. Holt; Second, Etzler & Moses; Third, C. D. Johnson.

Boar and Three Sows Under One Year, Bred by Exhibitor.—First, Etzler & Moses; Second, W. R. Holt; Third, T. W. Miller; Fourth, C. D. Johnson; Fifth, C. F. Cassady & Sons.

Get of Sire.—First, Etzler & Moses; Second and Third, W. R. Holt; Fourth, T. W. Miller; Fifth, Etzler & Moses; Sixth, C. D. Johnson.

Produce of Sow.—First, Etzler & Moses; sixth, C. D. Johnson. Miller; Fourth, W. R. Holt.

Sweepstakes, Boar any age.,—Etzler & Moses.

Sweepstakes, Sow any age.—Etzler & Moses.

Sweepstakes, Boar any age, Bred by Exhibitor.—Etzler & Moses.

Sweepstakes, Sow any age, Bred by Exhibitor.—Etzler & Moses.

CHESTER WHITE.

EXHIBITORS.

Allen Bros., Russell, Iowa; W. T. Barr, Ames, Iowa; J. L. Barber, Harlan, Iowa; Jesse Bige, Webster City, Iowa; E. J. Brouhard, Colo, Iowa; L. G. Edge, Newton, Iowa; J. K. Helmick, Columbus Junction, Iowa; Rufus E. Hire, Knoxville, Iowa; Wm. A. Hoover, Oskaloosa, Iowa; F. D. Humbert, Nashua, Iowa; H. L. Orcutt, Monroe, Iowa; O. E. Osburn, Weston, Iowa; Geo. H. Lawshe, Harlan, Iowa; P. B Lake, Muscatine, Iowa; J. A. Loughridge, Delta, Iowa; J. H. Mahannah, North English, Iowa; Will Michael, Selma, Iowa; S. B. Mills, Ames, Iowa; E. L. Nagle

& Son, Deep River, Iowa; L. Pearson, Elwell, Iowa; L. C. Reese, Prescott, Iowa; Chas. Robertson, Lyons, Nebraska; J. L. Stittsworth, Knoxville, Iowa; J. W. Troy, Rose Hill, Iowa; Wm. Whitted & Sons; Monroe, Iowa; B. R. Vale, Boneparte, Iowa.

AWARDS.

Judge ....L. H. Roberts, Paton, Iowa.

Boar Two Years Old or Over.—First, Wm. A. Hoover; Second, E. J. Brouhard; third, Jessie Bige; fourth, L. C. Reese; fifth, Geo. H. Lawshe; sixth, J. L. Stittsworth; seventh, H. L. Orcutt.

Boar Eighteen Months and Under Two Years.—First, L. C. Reese; second, Will Michael; third, F. D. Humbert; fourth, J. A. Loughbridge; Fifth, Wm. A. Hoover; Sixth, W .T. Barr.

Boar One Year and Under Eighteen Months.—First, F. D. Humbert; second, E. J. Brouhard; third, J. L. Barber; fourth, E. L. Nagle & Son; Fifth, J. K. Helmick; Sixth, H. L Orcutt

Boar Six Months and Under One Year.—First, Jessie Bige; Second, J. H. Mahannah; Third, F. D. Humbert; Fourth, E. L. Nagle & Son; Fifth, J. K. Helmick; Sixth, Wm. A. Hoover; Seventh, L. C. Reese.

Boar Under Six Months.—First, F. D. Humbert; second, E. J. Brouhard; Third, H. L. Orcutt; Fourth, J. H. Mahannah; Fifth, Allen Bros.; Sixth, P. R. Vale; Seventh, J. H. Mahannah.

Sow Two Years Old or Over.—First and Second, F. D. Humbert; third, J. L. Barber; fourth, Wm. A. Hover; fifth, E. J. Brouhard; Sixth, Jesse Bige; Seventh, B. R. Vale.

Sow Eighteen Months and Under Two Years.—First, Wm. A. Hoover; Second and Third, F. D. Humbert; Fourth, Wm. A. Hoover; Fifth, L. C. Reese; Sixth, B. R. Vale; Seventh, J. L. Stittsworth.

Sow One Year and Under Eighteen Months.—First, J. L. Stittsworth; second, E. J. Brouhard; third, F. D. Humbert; fourth, H. L. Orcutt; Fifth, J. L. Barber; Sixth, Jesse Bige; Seventh, J. L. Barber.

Sow Six Months and Under One Year.—First, Wm. A. Hoover; Second, Jesse Bige; Third, J. L. Barber; Fourth, Wm. A. Hoover; Fifth, L. C. Reese; Sixth, F. D. Humbert; Seventh, J. H. Mahannah

Sow Under Six Months.—First, E. L. Nagle & Son; Second, H. L. Orcutt; third, F. D. Humbert; fourth, E. J. Brouhard; fifth, Wm. Whitted & Son; Sixth, F. D. Humbert; Seventh, Allen Bros.

Boar and Three Sows Over One Year.—First, Wm. A. Hoover; Second, F. D. Humbert; Third, L. C. Reese; Fourth, J. L. Stittsworth; Fifth, J. L. Barber; Sixth, B. R. Vale; Seventh, Wm. A. Hoover.

Boar and Three Sows Under One Year.—First, J. H. Mahannah; Second, Wm. A. Hoover; Third, F. D. Humbert; Fourth, Jesse Bige; fifth, E. J. Brouhard; sixth, H. L. Orcutt; seventh, E. L. Nagle & &Son.

Boar and Three Sows Over One Year, Bred by Exhibitor.—First, Wm. A. Hoover; Second, F. D. Humbert; Third, L. C. Reese; Fifth, Wm. A. Hoover.

Boar and Three Sows Under One Year, Bred by Exhibitor.—First, J. H. Mahannah; Second, Wm. A. Hoover; Third, F. D. Humbert; Fourth, Jesse Bige; Sixth, H. L. Orcutt; Seventh, E. L. Nagle & Son. , *Get of Sire.*—First, J. H. Mahannah; Second, F. D. Humbert; Third, E. J Brouhard; fourth, L. C. Reese; fifth, J. H. Maannah; sixth, J. L. Barber; Seventh, Jesse Bige.

Produce of Sow.—First, H. L. Orcutt; Second, Wm. Whitted & Son; Third and Fourth, E. J. Bronhard; Fifth, Allen Bros; Sixth, J. H Mahannah.

Sweepstakes, Boar any age.—L. C. Reese.

Sweepstakes, Sow any age.—F. D. Humbert.

Sweepstakes, Boar any age, Bred by Exhibitor..—Wm. A. Hoover.

Sweepstakes, Sow any age, Bred by Exhibitor.—F. D. Humbert

DUROC-JERSEY.

EXHIBITORS.

H. S. Allen, Russell, Iowa; A. P. Alsin, Boone, Iowa; Adolph P. Arp, Eldridge, Iowa; Elizabeth Beaver, Anita, Iowa; Arch Brown & Sons, Waterloo, Iowa; S. P. & C. M. Carr, Birmingham, Iowa; M. C. Cramer, Monroe, Iowa; D. B. Davenport, Carlisle, Iowa; U. G. Davidson, Manson, Iowa; Downs & West, Glidden, Iowa; Easton Bros., Galva, Iowa; Sherman Edwards, Bondurant, Iowa; W. S. Elliott, West Liberty, Iowa; M. M. Elmdorf, Lacona, Iowa; F. F. Failor, Newton, Iowa; F. Fowler & Son, Menlo, Iowa; S. P. Freed, Ames, Iowa; R. J. Harding, Macedonia, Iowa; W. J. Hartung, Maxwell, Iowa; Ernest E. Henderson, Central City, Iowa; John Henderson, Panora, Iowa; F. H. Herring, Iowa City, Iowa; Rufus E Hire, Knoxville, Iowa; Housman & Harmon, Laporte City, Iowa; Johnston Bros. & Newkirk, Brooklyn, Iowa; H. B. Louden & Son, Clay Center, Nebraska; Geo. R. Manifold, Shannon City, Iowa; Manley & Co., Lyons, Nebraska; May & Porter, Remington, Indiana; J. H. Menzel, Hazelton, Iowa; E. D. Michael, Selma, Iowa; C. R. Mills, Central City, Iowa; John M. Morrison, College View, Nebraska; G. A. Munson, Maxwell, Iowa; C. A. McCune, Menlo, Iowa; A. W. H. Orr, Lorimor, Iowa; O. Osborn, Maxwell, Iowa; O. E. Osburn, Weston, Iowa; D. J. Pollock, Lorimor, Iowa; A. E. Poush, Chariton, Iowa; Proud Advance Stock Co., Shannon City, Iowa; E. C. Prusia, Odebolt, Iowa; Austin Renshaw, Blair, Nebraska; W. H. Reed, Whitewater, Wisconsin; Mrs. A. F. Russell, Savannah, Missouri; E. J. Russell, Blair, Nebraska; D. Nauman, West Liberty, Iowa; J. E. Springer, Taintor, Iowa; G. W. Stout, Rose Hill, Iowa; A. T. Sundell, Paton, Iowa; Clint Triem, Laporte City, Iowa; Geo. W. Trone & Sons, Rushville, Illinois; J. W. Troy, Rose Hill, Iowa; R. G. Tweed, La Grande, Iowa; O. A. Wallace, Laporte City, Iowa; J. E. Wehr, Portsmouth, Iowa; W. L. Willey, Menlo, Iowa; C. A. Wright, Rosendale, Missouri.

Grand Avenue entrance to State Fair Grounds.

AWARDS.

Judge ....F. F. Luther, Grand Junction, Iowa.

Boar Two Years Old or Over.—First, Johnston Bros. & Newkirk; Second, Manley & Co.; Third, Proud Advance Stock Co., Shannon City; fourth, Arch Brawn & Sons; fifth, A. E. Poush; sixth, May & Porter; seventh, A. P. Alsin.

Boar Eighteen Months and Under Two Years.—First, D. J. Pollock; Second, S. P. Freed; Third, H. S. Allen; Fourth, M. M. Elmdorf; Fifth, A. P. Alsin; Sixth, F. F. Failor.

Boar One Year and Under Eighteen Months.—First, C. G. Davidson; Second, E. J. Russell; Third, W. H. Reed; Fourth, E. J. Russell; Fifth, G. A. Munson; Sixth, J. E Wehr; Seventh, O. E. Osburn.

Boar Six Months and Under One Year.—First, Second and Third, Johnston Brcs & Newkirk; Fourth, May & Porter; Fifth, Johnston Bros. & Newkirk; Sixth, Mrs. A. F. Russell; Seventh, W. H. Reed.

Boar Under Six Months.—First, E. J. Russell; Second, A. P. Alsin; Third, Johnston Bros. & Newkirk; Fourth, R. J. Harding; Fifth, Geo. R. Manifold; Sixth, H. S. Allen; Seventh, O. E. Osburn.

Sow Two Years Old or Over.—First, Johnston Bros. & Newkirk; Second, Manley & Co.; Third, Proud Advance Stock Co.; Fourth, E. J. Russell; Fifth, A. P. Alsin; Sixth, R J. Harding; Seventh, F. H. Herring.

Sow Eighteen Months and Under Two Years.—First, H. S. Allen; Second, Easton Bros.; Third, Manley & Co.; Fourth, F. F. Failor; Fifth, W. H. Reed.

Sow One Year and Under Eighteen Months.—First, Austin Renshaw; Second, Ernest E. Henderson; Third, Johnston Bros. & Newkirk; Fourth, A. P. Alsin; Fifth, Easton Bros.; Sixth, R. J. Harding, Seventh, F. H. Herring.

Sow Six Months and Under One Year.—First and Second, Johnston Bros. & Newkirk; Third, Manley & Co.; Fourth, W. J. Hartung; Fifth, Johnston Bros & Newkirk; Sixth, Easton Bros.; Seventh, Johnston Bros. & Newkirk.

Sow Under Six Months.—First, Johnston Bros. & Newkirk; Second, A. P. Alsin; Third, Johnston Bros. & Newkirk; Fourth, E. J. Russell; fifth, Geo. R. Manifold; sixth, John M. Morrison; seventh, Johnston Bros. & Newkirk.

Boar and Three Sows Over One Year.—First, Manley & Co.; Second, E. J. Russell; Third, W. H. Reed.

Boar and Three Sows Under One Year.—First and Second, Johnston Bros. & Newkirk; Third, E. J. Russell; Fourth, A. P. Alsin; Fifth, H. S. Allen; Sixth, May & Porter; Seventh, Manley & Co.

Boar and Three Sows Over One Year, Bred by Exhibitor.—First, Manley & Co.; Second, E. J. Russell; Third, W. H. Reed.

Boar and Three Sows Under One Year, Bred by Exhibitor.—First, E. J. Russell; Second, A. P. Alsin; Third, Johnston Bros. & Newkirk; Fourth, Manley & Co.; Fifth, May & Porter; Sixth, H. S. Allen; Seventh, G. A. Munson.

Get of Sire.—First, Johnston Bros & Newkirk; Second, Manley & Co.; Third, H. S. Allen; Fourth, E. J. Russell; Fifth, A. P. Alsin; Sixth, E. J. Russell; seventh, May & Porter.

Produce of Sow.—First, E. J. Russell; Second, A. P. Alsin; Third, Geo. R. Manifold; fourth, O. E. Osburn; fifth, H S. Allen; sixth, D. J. Pollock; Seventh, Ernest E. Henderson

Sweepstakes, Boar any age.——. G. Davidson.

Sweepstakes, Sow any age.—Austin Renshaw.

Sweepstakes, Boar any age, Bred by Exhibitors.—Johnston Bros. & Newkirk.

Sweepstakes, Sow any age, Bred by Exhibitor.—Austin Renshaw.

SHEEP DEPARTMENT.

Superintendent.... ....H. L. Pike, Whiting, Ia.

MERINOS, AMERICAN, SPANISH OR DELAINE.

EXHIBITORS.

H. E. and E. M. Moore, Orchard Lake, Michigan.

AWARDS.

Judge ....**O. C. Roby.**

Ram Two Years Old or Over.—First and Second, H. E. and E. M. Moore.

Ram One Year and Under Two.—First, second and third, H. E. and E. M. Moore.

Ram Lamb.—First, second and third, H. E. and E. M. Moore.

Ewe Two Years Old or Over.—First, second and third, H. E. and E. M. Moore.

Ewe One Year and Under Two.—First, second and third, H. E. and E. M. Moore.

Ewe Lamb.—First, second and third, H. E. and E. M. Moore.

Get of Sire.—First, H. E. and E. M. Moore.

Sweepstakes, Pure bred Ram, any age.—H. E. and E. M. Moore.

Sweepstakes, Pure Bred Ewe any age.—H. E. and E. M. Moore.

RAMBOUILLET.,

EXHIBITORS.

F. W. Harding, Waukesha, Wisconsin; H. E. and E. M. Moore, Orchard Lake, Michigan; Robert Taylor, Abbott, Nebraska.

AWARDS.

Judge...... ....O. C. Roby.

Ram Two Years Old or Over.—First, H. E. and E. M. Moore; Second, F. W. Harding; Third, Robert Taylor.

Ram One Year and Under Two.—First, Robert Taylor; Second, F. W. Harding; Third, H. E. and E. M. Moore.

Ram Lamb.—First, H. E. and E. M. Moore; Second, Robert Taylor; Third, H. E. and E. M. Moore.

Ewe Two Years Old or Over.—First, H. E. and E. M. Moore; Second and third, Robert Taylor.

Ewe one Year and Under Two.—First and Second, H. E. and E. M. Moore; Third, Robert Taylor.

Ewe Lamb.—First, H. E. and E. M. Moore; second, Robert Taylor; Third, H. E and E. M. Moore

Get of Sire.—First, H. E. and E. M. Moore; Second, F. W. Harding.

Sweepstakes, Pure Bred Ram, any age.—Robert Taylor.

Sweepstakes, Pure Bred Ewe, any age.—H. E. and E. M. Moore.

COTSWOLDS.

EXHIBITORS.

W. S. Dixon, Brandon, Wisconsin; F. W. Harding, Waukesha, Wisconsin; Lewis Bros., Camp Point, Illinois.

AWARDS.

Judge ....W. T. Rutherford, Ames, Iowa.

Ram Two Years Old or Over.—First, Lewis Bros.; Second, F. W. Harding; Third, Lewis Bros.

Ram One Year Old and Under Two.—First, Lewis Bros.; second and third, F. W. Harding.

Ram Lamb.—First, Lewis Bros.; second and third, F. W. Harding.

Ewe Two Years Old or Over.—First, Lewis Bros.; second F. W. Harding; third, Lewis Bros.

Ewe One Year Old and Under Two.—First, F. W. Harding; second and third, Lewis Bros.

Ewe Lamb.—First, F. W. Harding; second, Lewis Bros.; third, F. W. Harding.

Get of Sire.—First, F. W. Harding.

Sweepstakes, Pure bred ram, any age.—Lewis Bros.

Sweepstakes, Pure bred ewe, any age.—Lewis Bros.

LEICESTERS.

EXHIBITORS.

Robert Taylor, Abbott, Nebraska.

AWARDS.

Judge .... W. T. Rutherford, Ames, Iowa.

RamTwo Years Old or Over.—First, Robert Taylor.

Ram One Year Old and Under Two.—First, Robert Taylor

Ram Lamb.—First and second, Robert Taylor.

Ewe Two Years Old or Over.—First and second Robert Taylor.

Ewe One Year Old and Under Two.—First and second, Robert Taylor.

Ewe Lamb.—First and second, Robert Taylor.

Get of Sire.—First, Robert Taylor.

Sweepstakes, pure bred ram, any age.—Robert Taylor.

Sweepstakes, pure bred ewe, any age.—Robert Taylor.

LINCOLNS.

EXHIBITORS.

Charles Boland, Williamsburg, Iowa; W. S. Dixon, Brandon, Wisconsin; Lewis Bros., Camp Point, Illinois.

AWARDS.

Judge ....W. T. Rutherford, Ames Iowa.

Ram Two Years Old or Over.—First, Charles Boland; second, Lewis Bros.

Ram One Year Old and Under Two.—First, Charles Boland; second, and third, Lewis Bros.

Ram Lamb.—First and second, Charles Boland; third, Lewis Bros.

Ewe Two Years Old of Over.—First and second, Charles Boland; third, Lewis Bros.

Ewe One Year and *Under Two.*—First, Lewis Bros.; Second Charles Boland.

Ewe Lamb.—First and second, Charles Boland; third, Lewis Bros.

Get of Sire.—First, Charles Boland; second, Lewis Bros.

Sweepstakes, Pure Bred Ram, any age.—Charles Boland.

Sweepstakes, Pure Bred Ewe, any age.—Charles Boland.

HAMPSHIRE DOWNS.

EXHIBITORS.

Robert Taylor, Abbott, Nebraska.

AWARDS.

Judge .... W. T. Rutherford, Ames, Ia.

Ram Two Years Old or Over.—First and second, Robert Taylor.

Ram One Year and Under Two.—First, Robert Taylor.

Ram Lamb.—First, second and third, Robert Taylor.

Ewe Two Years Old or Over.—First, Robert Taylor.

Ewe One Year Old and Under Two.—First, Robert Taylor.

Ewe Lamb.—First, second and third, Robert Taylor.

Get of Sire.—First and second, Robert Taylor.

Sweepstakes, Pure Bred Ram, any age.—Robert Taylor.

Sweepstakes, Pure Bred Ewe, any age.—Robert Ttylar.

SHROPSHIRE DOWNS.

EXHIBITORS.

W. M. Black, Knoxville, Iowa; Chandler Bros., Kellerton, Iowa; W. S. Dixon, Brandon, Wisconsin; E. S. Donahey, Newton, Iowa; L. A. Elliott, Iowa City, Iowa; J. S. Faucett, Springdale Iowa; W. O. Fritchman, Muscatine, Iowa; F. W. Harding, Waukesha, Wisconsin; F. P. McAdoo, Indianola, Iowa; George McKerrow & Sons, Pewaukee, Wisconsin; H. L. Orcutt, Monroe, Iowa; O. H. Peasly, Indianola, Iowa; Plumly Bros., Springville, Iowa; Ed. Wineland, Avoca, Iowa.

AWARDS.

Judge ....W. T. Rutherford, Ames Iowa.

Ram Two Years Old or Over.—First. Geo. McKerrow & Sons; second, W. O. Fritchman; third, Chandler Bros.

Ram One Year and Under Two.—First, F. W. Harding; second, Chandler Bros.; Third, F. W. Harding.

Ram Lamb.—First, F. W. Harding; Second, F. P. McAdoo; Third, Ed. Wineland.

Ewe Two Years Old or Over.—First, W. O. Fritchman; Second, Chandler Bros.; Third, Geo. McKerrow & Sons.

Ewe One Year and Under Two.—First, F. W. Harding; Second and Third, Chandler Bros.

Ewe Lamb.—First and Second, F. W. Harding; Third, Chandler Bros.

Get of Sire.—First, F. P. McAdoo; Second, Ed. Wineland.

Sweepstakes, Pure Bred Ram, any age.—F. W. Harding.

Sweepstakes, Pure Bred Ewe, any age.—F. W. Harding.

IOWA SHROPSHIRES.

EXHIBITORS.

Chandler Bros., Kellerton, Iowa; E. S. Donahey, Newton, Iowa; L. A. Elliott, Iowa City, Iowa; J. S. Faucett, Springdale, Iowa; W. O. Fritchman, Muscatine, Iowa; F. P. McAdoo, Indianola, Iowa; H. L. Orcutt, Monroe, Iowa; O. H. Peasely, Indianola, Iowa; Plumly Bros., Springville, Iowa; Ed. Wineland, Avoca, Iowa.

AWARDS.

Judge ....W. T. Rutherford, Ames Iowa.

Ram Two Years Old or Over.—First, W. O. Fritchman; second, Chandler Bros.; third, W. O. Fritchman.

Ram One Year and Under Two.—First, Chandler Bros.; second, W. O. Fritchman; third, Chandler Bros.

Ram Lamb —First, F. P. McAdoo; second, Ed. Wineland; third, Chandler Bros.

Ewe Two Years Old or Over.—First, Chandler Bros.; second, W. O. Fritchman; third, Chandler Bros.

Ewe One Year and Under Two.—First, second and third, Chandler Bros.

Ewe Lamb.—First, Chandler Bros.; second and third, Ed. Wineland,

Sweepstakes, Ram any age.—Chandler Bros.

Sweepstakes, Ewe, any age.—Chandler Bros.

Get of Sire.—First, Ed. Wineland; second, Chandler Bros.

Flock.—First, Chandler Bros.; second, Plumly Bros.; third, F. P. McAdoo.

OXFORD DOWNS.

EXHIBITORS.

W. S. Dixon, Brandon, Wisconsin; John Graham & Sons, Eldora, Iowa; Geo. McKerrow & Sons, Pewaukee, Wisconsin, Ed. Wineland, Avoca, Iowa.

AWARDS.

Judge ....W. T. Rutherford, Ames Iowa.

Ram Two Years Old or Over.—First, second and third, Geo. McKerrow & Sons.

Ram One Year Old and Under Two.—First and second, Geo. McKerrow & Sons; third, John Graham & Sons.

Ram Lamb.—First, Geo. McKerrow & Sons; second, John Graham & Sons; Third, Ed. Wineland.

Ewe Two Years Old or Over.—First and second, Geo. McKerrow & Sons; third, Ed. Wineland.

Ewe One Year and Under Two.—First and Second, Geo. McKerrow & Sons.

Ewe Lamb.—First and second, Geo. McKerrow & Sons; third, Ed. Wineland.

Get of Sire.—First. John Graham & Sons; second, Ed. Wineland.

Sweepstakes, Pure Bred Ram, any age.—Geo. McKerrow & Sons.

Sweepstakes, Pure Bred Ewe, any age.—Geo. McKerrow & Sons. Sons.

IOWA OXFORD DOWNS.

EXHIBITORS.

John Graham & Son, Eldora, Iowa; Ed. Wineland, Avoca, Iowa.

AWARDS.

Judge ....W. H. Rutherford, Ames, Iowa.

Ram Two Years Old or Over.—First and Second, John Graham & Sons.

Ram One Year and Under Two.—First John Graham & Sons; Second, Ed. Wineland; Third, John Graham & Sons.

Ram Lamb.—First. John Graham & Sons; Second, Ed. Wineland; Third, John Graham & Sons.

Ewe Two Years Old or Over.—First and Second, Ed. Wineland.

Ewe Lamb.—First, Ed. Wineland; Second, John Graham & Sons.

Sweepstakes, Ram, any age.—John Graham & Sons.

Sweepstakes, Ewe, any age.—Ed. Wineland.

Get of Sire.—First, John Graham & Sons.

Flock.—First, Ed. Wineland.

SOUTH DOWNS.

EXHIBITORS.

Geo. McKerrow & Sons, Pewaukee, Wisconsin; Ed. Wineland, Avoca, Iowa.

AWARDS.

Judge .... W. T. Rutherford, Ames, Ia.

Ram Two Years Old or Over.—First and second, Geo. McKerrow & Sons.

Ram One Year and Under Two.—First and second, Geo. McKerrow & Sons.

Ram Lamb.—First and Second, Geo. McKerrow & Sons.

Ewe Two Years Old or Over.—First and second, Geo. McKerrow & Sons; Third, Ed. Wineland.

Ewe One Year and Under Two.—First and second, Geo. McKerrow & Sons.

Ewe Lamb.—First and second, Geo. McKerrow & Sons.

Get of Sire.—Geo. McKerrow & Sons.

Sweepstakes, Pure Bred Ram, any age.—Geo. McKerrow & Sons.

Sweepstakes, Pure Bred Ewe, any age.—Geo. McKerrow & Sons.

SWEEPSTAKE FLOCKS.

MERINO FLOCKS.

EXHIBITORS.

F. W. Harding, Waukesha, Wisconsin; H. E. & E. M. Moore, Orchard Lake, Michigan; Robert Taylor, Abbott, Nebraska.

AWARDS.

Judge ....O. C. Roby,

Flock of pure bred Merinos, any age.—Not less than one ram and five ewes.—First, H. E. and E. M. Moore; second, Robert Taylor; third H. E. & E. M. Moore.

LONG WOOL FLOCKS.

EXHIBITORS.

Charles Boland, Williamsburg, Iowa; F. W. Harding, Waukesha, Wisconsin; Lewis Bros., Camp Point, Illinois; Robert Taylor, Abbott, Nebraska.

AWARDS.

Judge ....W. H. Rutherford, Ames, Iowa.

Flock of pure bred Long Wool, any age.—Not less than one ram and five Ewes.—First, Lewis Bros.; second, F. W. Harding; third, Lewis Bros.

MIDDLE WOOL FLOCKS. SHROPSHIRES AND SOUTH DOWNS.

EXHIBITORS.

L. A. Elliott, Iowa City, Iowa; W. O. Fritchman, Muscatine, Iowa; F. W. Harding, Waukesha, Wisconsin; H. L. Orcutt, Monroe, Iowa; Plumly Bros., Springville, Iowa; Ed. Wineland, Avoca, Iowa; Geo. McKerrow & Sons, Pewaukee, Wisconsin.

AWARDS.

Judge ....W. H. Rutherford, Ames, Iowa.

Flock of pure bred Middle Wool, any age.—Not less than one ram and five ewes.—First, Geo. McKerrow & Sons; second, F. W. Harding.

MIDDLE WOOL FLOCKS.

OXFORDS, HAMPSHIRE DOWNS AND DORSETS.

EXHIBITORS.

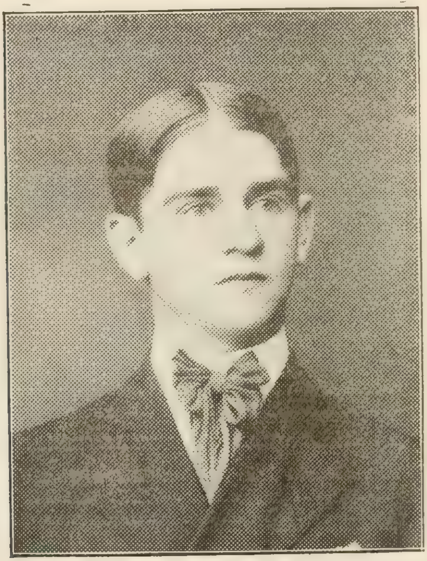
Geo. McKerrow & Sons, Pewaukee, Wisconsin; Robert Taylor, Abbott, Nebraska; Ed. Wineland, Avoca, Iowa.

AWARDS.

Judge ....W. H. Rutherford, Ames, Iowa.

Flock of pure bred Middle Wool, any age.—Not less than one ram and five ewes.—First, Geo. McKerrow & Sons; second, Robert Taylor, Third, Ed. Wineland.

Iowa State Fair
SCHOLARSHIP JUDGING CONTEST
1905.



ROY L. IGO.
Successful Contestant.

SCORINGS OF CONTESTANTS.

Standing.		STOCK	CORN.	TOTAL.
		Possible. 600	Possible. 230	Possible 830
1	Igo, Roy S., Indianola	532	166½	698½
2	Gross, W. R., Avoca	525	164	689
3	McDonald, Murl, Shenandoah	484	187½	671½
4	Moore, C. Ray, Kellerton	547	122	669
5	Reeve, Chas., Geneva	520	143	663
6	Secor, Perry R., Melbourne	497	162½	659½
7	Kenison, Frank R., Madrid	479	179¼	658¼
8	Shaver, E. P., Kalona	490	160	650
9	Sellers, C. E., Green Mountain	455	186½	641½
10	Kennedy, Carl N., Ankeny	469	168¼	637¼
11	Taff, Paul C., Panora	491	139½	630½
12	Jay, Albert, Blakesburg	506	124	630
12	Hawk, Fred, Grundy Centre	495	135	630
14	Crow, Frank N., Oxford	462	169	629
15	Williams, Elwood H., Mt. Pleasant	515	104	619
16	Probert, J O , Wodena	479	135	614
17	Mann, Curtis, Bradyville	427	182½	609½
18	Preston, Howard H., Battle Creek	440	164	604
19	Meints, Harry, Grand Mound	464	137½	601½
20	Crane, Walter, Kilbourne	462	133¼	595¼
21	Rail, John A., Birmingham	435	154½	589½
22	Tracey, Frank E., Nashua	452	117	569
23	Kaefring, Fern, Oxford	445	120	565
24	Hales, J. Miller, Keosauqua	414	147	561
25	Weston, Albert W., Audubon	374	173½	547½
25	Reynolds, T. R , Pleasantville	430	117½	547½

W. J. RUTHERFORD,
Superintendant of Contest.

Press Comments of the Iowa State Fair of 1905

Held at Des Moines, Iowa, August 25 to September 1

AND

PAPERS REGARDING FAIRS IN GENERAL.

THE IOWA STATE FAIR.

WALLACES' FARMER, DES MOINES.

It is not enough to say that the Iowa State Fair held at Des Moines last week justified all predictions and broke all previous records. It did more than this. It set a high water mark, not only for Iowa but for other states in which the aim is to make the annual state fairs great agricultural expositions—clean, helpful, educational. For after making due allowance for what might be thought a natural bias in speaking of one's home fair, impartial and competent critics must agree with us in the statement that the fair at Des Moines last week, considering both the exhibits and the character of the people who came to see it, came closer to the ideal fair of an agricultural community than any which has ever been held anywhere in the central and western states—in the agricultural country—up to the present time.

The generally good crops in all sections of the state justified the expectations that with favorable weather the attendance would break all previous records. As a matter of fact it was even greater than anticipated. The crowds began to arrive in Des Moines early Monday morning and by evening every in-coming train was loaded to the capacity of the cars. Monday night the railroads reaching Des Moines rushed out emergency cars which were distributed at convenient points along their respective lines, but notwithstanding this foresight almost every train reaching the city Tuesday, Wednesday, and Thursday had not only every seat filled but the aisles crowded with people standing. By Wednesday night the cash receipts at the grounds exceeded the receipts of the entire week last year and footed up enough to more than cover the entire expenses. The receipts for the remainder of the week will leave a handsome surplus on hand, part of which will doubtless be added to the necessary reserve against future misfortune and the remainder used to still further improve the grounds and provide for the comfort of the people.

It was a happy, prosperous-looking crowd. There were few able to report such monstrous crops as the optimistic crop boomers have been seeing through their convex glasses, but from every section came the reports of bounteous yields and bright prospects for the fall harvest. An occasional bottom land farm has suffered severely from abnormal rainfall or cloudburst, but neither animals nor people will need to go hungry in Iowa this year, and there wil be plenty to spare for those who wish to buy. Therefore,the farmer at Des Moines last week was happy and he showed it. He was out for a day or so of well earned recreation. In a great many cases he brought the good wife and some of the little folks along, and after the tire wears off they will all be the better for the outing.

As for the fair itself, it was bigger, better, cleaner than ever before. Every available foot of exhibition space seemed to be filled. The live stock exhibit, in which Iowa always leads, was better all around than ever before. This will be dealt with at length elsewhere by our corps of live stock representatives. A particularly gratifying feature was the increasing percentage of home bred animals. The space in the different exposition halls was fully occupied with attractive exhibits. The display of machinery and farm appliances was immense. Each year we hear rumors of an agreement among machinery manufacturers to discontinue exhibiting at Des Moines, but we notice that each succeeding year this department requires more room. The fact is that the manufacturer of improved agricultural machinery is not living up to his advertising opportunities if he fails to show at Des Moines. There is no department of the fair that receives the closer or more critical attention of the well-to-do Iowa farmer than this. Scarcity of competent help has driven him to utilize labor-saving machinery to the utmost. He no longer requires of the machine that it do the work of two or three men. If it will do the work of one man, or even lighten his labor or increase his capacity, and can be be had at a reasonable price, the Iowa farmer will have it—and he is able to buy it and pay for it. Recognition of this condition is responsible for the growth of the exhibit of machinery and labor-saving devices. To make this exhibt easier to get at comfortably a large machinery hall is badly needed.

The fair this year more than ever before most fully justified our contention, made so often in the past, that the state fair is one of the greatest of Iowa's educational institutions and as such is entitled to the most liberal and whole-hearted support at the hands of the state legislature. It is not many years since the state board of agriculture was looked upon as a beggar at the doors of the general assembly, and what was given, was given grudgingly and more as a matter of charity than with the idea of building up an institution. We are referring now to the condition a number of years back. It must be confessed that at that time the management was not such as to justify unlimited confidence. In recent years this feeling has been changing somewhat, as is evidenced by the two magnificent permanent buildings, the live stock pavilion and the agricultural and horticultural hall. The time has now come when the fair should rank in the mind of the legislator with the other state educational institutions and should have the same hearty, earnest, and liberal financial support. The fair continues for only one week—practically for only five days—but in that length of time it is attended by 125,000 to 200,000 Iowa people. That is equivalent to the attendance of 1,000 to 2,000 students at a college or university each year for ten years. The college or university is maintained at large expense to educate a favored few young men and young women for their life work. The state fair furnishes an object lesson for a few days once a year for young as well as old. It gives them an opportunity to learn what they can not learn anywhere else, and at the same time a pleasant outing after the season's hard work. The college or university is for the young. The state fair is for these also, but as much or more for those whose toil has made the schools possible. We insist, therefore, that the state legislature can not be too liberal in providing for the fair. Whatever can be done to make it more instructive, more educational, and more comfortable to attend should be done. Its special needs now are a good hog pavilion, a machinery hall, a large open building to take the place of the eight of ten "shacks" now used for dining halls, and a fire-proof amphitheater or grand stand. These four buildings are badly needed. They should be of permanent character, architecturally attractive, and completed before the fair next year.

A fire-proof concrete and steel grand stand is urgently needed—how urgently can only be realized by those who were on the grounds Wednesday, the day on which all previous attendance records were broken. The grand stand that afternoon was filled to its utmost capacity, a sea of human beings enjoying the races and the entertainment program carried out each day. About the middle of the afternoon one of the eating house buildings, several blocks away from the grand stand, caught fire and for a few moments made quite a blaze, although at no time threatening the grand stand in the least. The blaze and smoke, however, caught the eye of some addle pate in the quarter stretch who started the cry of "fire." Only those who were facing the grand stand and saw the tremor that swept like a wave over the immense through occupying it can appreciate by what a narrow margin a catastrophe greater than Iowa has ever seen was averted. A panic at that time would have resulted in the death or serious injury of hundreds, and perhaps thousands, of people. It was a narrow escape and a horror was averted only by the prompt assurance by level-headed persons scattered through the crowd that the alarm was a "fake," and the statement of fair officials that it was simply a practice run of the fire department. The incident taught a lesson which should be heeded. Human lives are too precious to be placed in jeopardy in such a fire trap as the present grand stand. The amusement feature of the fair as now conducted is legitimate, and immense crowds in front of the race track each afternoon must be taken care of. A fire-proof structure should be provided before another fair. Iowa can not afford to risk the lives of six or eight thousand of her citizens when the risk can be eliminated by the expenditure of a few thousands of dollars. This need is imperative.

For a number of years after the World's Fair at Chicago the Iowa and other state fairs, and hundreds of county fairs as well, were well nigh submerged in the flood of filthy side shows, spawn of the Chicago

Midway. The fair management had the notion that the tribute paid by these disreputable exhibitions for the privilege of corrupting the people was necessary to the financial success of the fair. Experience has shown how utterly wrong this notion was. Careful examination last week failed to discover even one questionable concession. Has the fair suffered from the loss of this revenue? The answer will be found in the financial statement of last week. The receipts from concessions this year exceeded by about four thousand dollars the receipts of any previous year. It is a sledge hammer answer to those who think it pays to license dirtiness. Legitimate concessions can afford, and are willing, to pay a double tax when the foul-mouthed, brass-tongued barkers are shut out. And what has been true at Des Moines will prove true elsewhere. Let our county fairs profit by the experience.

Interest is increasing in the judging contest for boys, the premium being a $200 scholarship at the Iowa Agricultural College. Last year but thirteen boys entered this contest; this year there were just twice that number. This contest is open to any young man under twenty-one who has not been regularly classified in an agricultural college. Each contestant is required to judge two rings each of horses, cattle, and hogs, and two varieties of corn, the award going to the boy whose work grades highest and who gives the best reasons in writing for his decisions. The first contest, held two years ago, was won by Ellis Rail, of Birmingham, Iowa, who attributed his success to a careful study of Wallaces' Farmer. Last year the winner was Chas. Steen, of West Liberty, another careful student of Wallaces' Farmer and one of the prize winners in our boys' corn contests the preceeding year. This year the honor still stays within the "family", the successful contestant being Roy Igo, of Indianola. Second place was occupied by Wm. R. Gross, Avoca; third, Murl McDonald, Shenandoah; fourth, C. Ray Moore, Kellerton. Standing of the others will be found elsewhere.

The weather for one week at least entirely ignored the weather man. The latter promised fair weather and showers alternately, but each day the sun shone out serenely and the weather was ideal for the season. Rains to the north of Des Moines Wednesday night probably decreased the attendance Thursday from that section.

The woman's building afforded a haven of rest for tired women, while the emergency hospital with physician and nurse in attendance afforded prompt relief to those who met with accident of one sort or another or became seriously indisposed.

THE IOWA STATE FAIR.

THE HOMESTEAD.

There are a few factors essential to the making of a great fair, among which are sensible management, good equipment and fair weather. When these conditions are right there can be made an accurate test of the possibilities of a people's ability acting in the capacity of exhibitors. Bearing this fact in mind the statement can be boldly made that Iowa demonstrated last week that she has ability to put up one of the greatest, if not absolutely the greatest fair held in this country. When the gates closed last Friday night a record had been made in attendance, excellence and variety of exhibits and success in management.

The weather being ideal throughout the week insured much the largest attendance in the history of the Iowa State Fair, this being naturally expected, owing to the marked degree of prosperity that prevails in the corn belt. Expectations, however, in this regard were more than realized and a handsome surplus was piled up for future use to make a still greater fair. Although there has been but little building since the fair of 1904, yet the fair management were better equipped than ever not only to give visitors a good time, but to give it under conditions that made it easy to take. The plan of keeping the grounds free from refuse was favorably commented on by visitors. The hillsides and valleys on the fair grounds never had a better covering of blue grass, so that campers and picnickers fairly reveled in the luxury of the outing.

One important feature in connection with the holding of any fair is the transportation of the crowd to and from the grounds. Last week the service was well-nigh perfect. The Des Moines street car company made a remarkable record in the service it rendered. The fact that the company was able to handle between 100,000 and 200,000 people with but a single accident to one individual, in which the company was absolutely blameless, is a record that will do much to contribute to success of similar events held in Des Moines. The comfortable and always reliable service rendered by the Rock Island railroad did much to relieve congestion. As to the matter of caring for the people, Des Moines proved ample for the occasion. There were those of course who failed to find accommodation, but the Commercial Club was able to care for everybody that applied and could have accommodated even more. For the benefit of readers who may have met with some disappointment regarding accommodation, we will say that it is never a wise thing to go to the grounds without first having provided yourself with a good lodging place. This can always be done in Des Moines either at the hotels or through the medium of the Commercial Club. Thousands of good homes in the city are thrown open to visitors during fair week. No little credit is due the police force of the city for the order maintained during the week, there being no hold-ups reported and but little petty thieving. The records made demonstrated, as has been done previously, that Des Moines is a "safe" city. As for the fair management, it simply surpassed itself; which is equivalent to saying that nothing was left to be left to be desired in that direction. Especially commendable was the exclusion of fakirs and objectionable side shows, the exhibition as a whole being absolutely clean. President Morrow, Secretary Simpson and their coadjutors have great reason to congratulate themselves on the results achieved.

The entertainment furnished this year was acknowledged to be superior to any past events of this character. The records made on the race track were remarkably good, considering the fact that the speed-way is but a half mile, while the vaudeville talent engaged proved to be far above the average. In this connection, however, it may be stated that the amphitheater is entirely too small to accommodate the people. While large additions are necessary, yet it would not be wise to add structures of the same character as the old one. The state legislature should at once make an appropriation sufficient to erect a large, steel-framed, fire-proof amphitheater. It almost fills one with horror to think of what might happen in case fire should break out when 8,000 or 10,000 people are seated in an inflammable structure of this kind. Unless this matter is given attention during the next session of the legislature, there is no telling but that an indelible blot may be placed on the state's escutcheon. The Missouri fair, though young in years, has set the pace in the character of the equipment being placed on its fair grounds; and while Iowa has made a magnificent start in the erection of permanent equipment, yet it is our opinion that there should be no more delay in following Missouri's precedent to the fullest extent.

The plan of cataloguing animals as carried out last week was one of the most commendable features of the fair, adding as it did immensely to its value to those interested in live stock. The judging pavilion proved to be a center of attraction during the entire week, and with the assistance of the catalogues each visitor could secure all the necessary information about individual animals. It is unfortunate that there is not room in the present judging pavilion to handle both horses and cattle, and this simply points to the necessity of erecting another in the immediate future. If this were done judging could be finished up earlier in the week and parades made daily with the prize-winning stock.

Creditable exhibits were made by Clayton and Cherokee counties in the northern district; Polk and Delaware in the central; and Cass, Lucas, Warren and Marion in the southern, premiums being awarded in the order in which the counties are mentioned above. This feature of the fair should be extended to many other counties and more novelty and variety imparted to the exhibits. It is unfortunate that the counties do not make appropriations for exhibits of this kind. At present it is done by individual effort, the only remuneration received being the premiums awarded by the fair association. There is no reason why each county cannot put a few hundred dollars into a respectable exhibit. If this were done the field crop department could be made one of the grand popular features of the fair. The agricultural display, apart from the county exhibits, was excellent and of fairly large proportions. The horticultural display was excellent in quality and extensive enough to furnish the visitor interested in this line with plenty of material to inspect.

A very interesting judging contest was held, twenty-six young men under twenty-one competing for the $200 scholarship prize at the Iowa Agricultural College. This contest was won by Roy L. Igo, of Indianola, Iowa, his score being 698½ points out of a possibly 800. His nearest competitor was Wm. R. Gress, of Avoca, Iowa, with 689 points, the third being Murl McDonald, of Shenandoah, Iowa, with 671½ points.

CATTLE.

It is doubtful if there has ever been made a better show of cattle than that made in Des Moines last week. Certainly Iowa has never in past years reached so high a standard, taking into consideration all classes of cattle. True it is that in some breeds stronger showings have been made in the past, but taking into account all breeds the above statement is absolutely correct. Men who have been attending the fair for more than a quarter of a century acknowledge that the quality was never so high. They noted particularly the absence of what might be called low-grade pure-breds, and many called attention to the fact that the fair was greatly improved by bringing out only animals that are worthy of a premium in the absence of competition. It is well known that in the past at many fairs the live stock departments are filled up with considerable rubbish simply to clean up the premiums. There was scarcely a single instance of this kind in Des Moines last week. The idea of offering premiums for exhibitors who live within the boundaries of the state is an excellent one and the contests this year have absolutely established the fact that the principle is right.

HORSES.

The horse division of the Iowa State Fair proved to be one of the big departments this year, as indicated by the fact that the capacity of the stabling was more than taxed by the number on exhibition. Although a few of the large breeders who were formerly represented at the Iowa State Fair were absent this year, yet their place was taken by a number of new exhibitors. This in itself is a most hopeful feature, and indicates rather a better situation than if a few breeders came in and swept the board. The quality would average high throughout and even in a few classes that were not well filled the winning animals would have been factors in any kind of competition.

SWINE.

DUROC-JERSEYS.

It is not near enough the mark to say that the Duroc show at the Iowa State Fair was one of the best that has ever been made—it was actually the best. The exhibit of Durocs numbered between 800 and

900 head. In more than one instance there were over fifty animals lined up in a single class, so that the mere fact that an exhibitor got inside the money in any given class was an indication that his animals possessed merit in a marked degree. The judging was done by Mr. F. F. Luther, of Grand Junction, Iowa, to the general satisfaction of exhibitors. If the large number of Durocs exhibited was not sufficient to indicate that this breed has won its way into the esteem of central West swine breeders, the quality represented would convince even the average visitor to the fair that the Duroc comes wonderfully near being an ideal corn-belt hog. It was evident that breeders are paying attention to the matter of length of body, and especially to strength of bone, as indicated by the fact that there were hundreds of Durocs on the ground showing splendid scale and yet with it all, walking squarely on their feet. Duroc breeders have shown wisdom in emphasizing this matter during past years and they are now showing to the world the results of their sensible efforts.

CHESTER WHITES.

No breed of hogs on the fair grounds attracted more attention from sight-seers than the Chesters. The exhibit made by this breed was sufficiently large to indicate that the Chesters occupy a prominent place in the state, though of course they were greatly out-numbered by the Polands and Durocs. A close examination of the entire Chester Exhibit indicated the fact that breeders are making great strides in their improvements. While there is plenty of scale, yet there is not that coarseness that characterized the breed some time ago. There is plenty of bone in the best ones, and yet real coarseness is conspicuous by its absence. It is plainly evident, also, that breeders are paying close attention to a good covering of hair, and in almost every case prize-winning animals possessed this characteristic in a marked degree.

BERKSHIRES.

Although the Berkshire showing, viewed from the standpoint of numbers, was smaller than the showing made by the Durocs and Polands, yet in point of quality the breed's past record was fully maintained and in some respects boosted a little higher. There were exceedingly few of what might be called tail-enders in the entire Berkshire showing. Mr. W. Z. Swallow, of Waukee, Iowa, tied the ribbons in the Berkshire classes, satisfying the contestants to a remarkable extent, but in this only coming up to his former reputation.

POLAND-CHINAS .

The Poland Chinas carried off the crown for the largest number of hogs of any breed on the ground, though they were pushed hard for this honor by the Durocs. By actual count there were 1,019 hogs on the ground. Out of this large number it is needless to say that there were good ones, not only by the score, but by the hundreds. Poland breeders never felt better over their showing, and had there been a contest between the two breeds represented by the largest number on the ground the excitement would certainly have run high. Men who were looking for good types of hogs, irrespective of color, were free to confess that the Poland and Duroc are getting very close together in size and conformation. The judging of the Polands was done by Mr. F. M. Lail, of Marshall, Mo., whose painstaking efforts were graciously received by the great majority of exhibitors. As compared with the record of former years possibly greater emphasis was placed on the matter of quality and finish than ever before. There were those, of course, who freely expressed the opinion that scarcely enough attention was given to bone and scale, though it must be confessed that the prize-winning animals had plenty of bone, or at least plenty of strength to carry their weight. The premium Polands this year certainly represent a high type of hog, though there will be plenty of skill required on the part of breeders to keep them just where they are. Breeders of every class of stock are constantly changing the type, this being done to adapt it to conditions that are changing. In view of this fact it is not natural to find great changes in the names that appear in the premium lists, and if there are instances where oldtimers' names appear but seldom it must not be inferred that their exhibit lacked merit in a high degree. A judge must have one type and stick to it in order to be consistent in all his awards.

SHEEP.

Never before has there been such a showing on the Iowa grounds of so many really first-class sheep as this year. The old barns, though most convenient for sheep, were made to groan under their heavy loads of barbered, trimmed and well-fed sheep of most excellent quality. In years past Iowa visitors had to be content with looking at sheep exhibited from outside the state. This year Iowa was not only represented in home classes, but Iowa breeders made themselves felt in open classes. Such men as W. O. Fritchman, Muscatine; Chas. Boland, Williamsburg; Chandler Bross, Kellerton; F. P. McAdoo, Indianola, Ed. Wineland, Avoca, and John Graham & Sons, Eldora, were among the exhibitors.

The sheep of Mr. W. O. Fritchman, of Muscatine, Iowa, deserve especial mention in the fact that Mr. Fritchman has been found at his post many years improving his Shropshires during times of depression, as well as in prosperity, and he has a flock which shows his master hand. He had here his first prize ewe at St. Louis, in 1904, a Minton ewe which has a wealth of beauty. He showed some yearlings which were shown as lambs at St. Louis, capturing first prizes at both shows. Mr. Ed. Wineland, of Avoca, Iowa, another old-time breeder of Shropshires and Oxfords, was on hand with an unusually fine lot of common-sense sheep, of a good and pleasing type. For coming off grass Mr. Wineland's sheep were in an excellent condition. Mr. Wineland has a ram lamb that will be a winner next year if nothing happens him. Mr. F. P. McAdoo, of Indianola, Iowa, was at the fair with his string of prize winners and some of the imported stuff had to take off hats to him. Sheep men will do well to keep their eyes on Mr. McAdoo along Shropshire lines. His pen of lambs which won a Shropshire special were fine. Mr. George Boland, of Williamsburg, Iowa, had as fine a lot of Lincoln sheep as it has been our lot to see for many a day Mr. Boland is not striving to get a mammoth size, but quality, and he has succeeded admirably. Chandler Bros., Kellerton, Iowa, are young men and young breeders of Shropshires, but they have won a reputation this year that has put them alongside of veterans. George McKerrow & Son, of Pewaukee, Wis., were on hand with their World's Fair and International winners in Oxfords and Southdowns. The senior member of this firm scarcely needs any introduction to our readers. His record has been one of marked success, his showing has become worldwide in reputation and his integrity is unquestioned. His sheep were shown by that genial and successful herdsman and showman, Dan Taylor. Another veteran in Cotswolds and Rambouillets was there in the person of Frank W. Harding, of Waukesha, Wis. Mr. Harding has been in the show rings of state and world's fairs ever since he was a mere boy and to say that he is successful does not put it strong enough.

POULTRY.

It was only a year or two ago that the exhibits at the Iowa State Fair out grow the old poultry house which had served a good purpose for so many years. Since that time the poultry exhibits have been housed in the old agricultural hall, which has proven to be ample in size and convenient in its arrangement.

The exhibit this year was the largest ever shown and the quality of everything is such as to show that education in this line has been getting in its work. Most poultry breeders will understand the inconvenience in showing well marked birds as early in the season as the time at which this fair is held. Many of the breeders have learned how to avoid some of these defects and the fine appearance birds present the last week in August is a matter of much comment.

THE IOWA STATE FAIR.

FARMERS' TRIBUNE.

The greatest state fair ever held in Iowa came to a most successful close on Friday, September 1. Last year's fair marked the close of the first fifty-year period in the state fair history of the queen of the corn belt states. This year the second fifty-year period was begun under the most favorable circumstances. The fair was a success from a financial standpoint as well as from the standpoints of exhibitors and visitors. The total cash receipts amounted to over $85,000, and, notwithstanding the fect that more and larger premiums were paid this year, the estimated surplus earned by the fair was fully $22,000, or twice the surplus earned last year. The department of agriculture now has $40,000 to its credit and is well prepared to make substantial improvements during the coming year. A new fire-proof steel grandstand, with a seating capacity of 12,000 will be erected at a probable cost of $35,000. The present grandstand is built of wood; it is old and has a seating capacity of only 6,500, which is entirely inadequate for present needs. In addition to this, other improvements are contemplated. The legislature will be asked to make liberal apropriations. Two hundred thousand dollars are needed for this work. The hog men are determined to have a swine pavilion which will cost $50,000, and they ought to have it. A state that can attract 3,000 swine to its annual fair, as Iowa did this year, should certainly provide a suitable place in which to exhibit them. A horse pavilion is needed as badly as a swine pavilion. A building suitable to accommodate the horses will cost another $50,000. A large and permanent exposition building commensurate in size and permanency with the extent and substantial character of Iowa's agricultural resources, should be erected and many other minor improvements should be made. It is, therefore, to be hoped that the next general assembly will be favorably disposed toward providing liberally for the state fair. The Iowa state fair has passed its period of infancy. This was done several years ago. It is no longer a baby, but a full-grown man, ready to broaden out, ready to make its influence for agricultural advancement felt as it never has been felt before. According to Secretary Simpson, ten years ago, that is in 1895, the total cash receipts of the fair amounted to $25,741; this year to $85,423, showing a gain of 300 per cent. The attendance reached 162,000 as compared to 125,000 last year, and this was away beyond the most sanguine expectations of the management.

The horse races went off without a single hitch. The relay races of the "cowgirls" from Montana proved a strong drawing card. The dexterity and rapidity with which these women mounted and dismounted their horses excited the admiration of all. The management has decided to continue this feature another year, but probably on a larger scale. The free entertainments in front of the grandstand were excellent; everything went off without a word of complaint being heard from anyone. The famous Italian military band, of which Signor Liberati is the director, gave the fullest measure of satisfaction. Sunday evening 10,000 lovers of music flocked to listen to the sacred concert given by this band. The audience sat spellbound for a period of two hours, and this intense interest in music continued throughout the entire week.

One feature which the board of directors added to the show this yaer, was an emergency hospital located on the fair grounds. The hospital was in charge of Dr. E. R. Limbocker, of Des Moines, and Police Matron Babcock, also of Des Moines. Several persons were taken to the hospital during the week, where they were cared for.

The check room for babies was another new feature that attracted a good deal of attention. Many tired mothers with cross babies brought their little ones to the check room to be cared for by competent nurses.

The charges for this were only ten cents per hour, and the babies were cared for as well as the mothers themselves could care for them. This feature was much appreciated. It will be continued next year, and the facilities of it will be increased.

In the agricultural building, the horticultural, agriculture and dairy displays were larger and better than ever. The county exhibits were more numerous and of better quality than usual. More inducements had been offered for county exhibits this year, and the result was gratifying. Cass county was awarded the first premium. More attention will be paid to county exhibits in the future, as this year's showing encouraged the management and caused them to realize that this feature is really one of great importance. A good exhibit at a state fair is one of the best and most paying advertisements a county can secure. County exhibits, if representative of the agriculture of the section they represent, are very instructive and serve to give visitors a comprehensive view of the agricultural pursuits and resources of the whole state.

A number of excellent pictures were to be seen in the agricultural building. One picture showed the old Iowa state capitol that stood at Iowa City when that town was the seat of government; another showed the present magnificent capitol at Des Moines, while a third was a beautiful representation of grasses and grains. These pictures were made by the state at an expense of $500, and were exhibited at the St. Louis exposition last year.

The Iowa State College exhibit was very instructive. One feature of this exhibit that attracted much attention was the chemical composition of corn. Five jars contained the relative amounts of starch, protein, fat, crude fiber and ash found in corn. The large per cent of starch and the relatively small per cent of protein which corn contains could be seen at a glance, and to many farmers, to whom the term "protein" had heretofore carried no definite meaning, the chemical conposition of corn became intelligible and comprehensible. Another interesting feature in connection with the college exhibit was a number of boxes prepared for testing the germinating power of corn. The different stages of development of corn silk from its first appearance until it has fully performed its function, were shown in glass jars by means of specimens preserved in alcohol. Numerous commercial products manufactured from corn were exhibited in bottles which enabled the farmers to more fully realize why it is impossible for corn ever to become the drug on the market it was some years ago. A complete root system of the matured plant which was dug from the ground and prepared by the Iowa State College, and which was neatly kept in a glass case, opened the eyes of many; farmers who were confident believers in deep cultivation were heard to remark: "I can now see why deep cultivation of corn is not desirable. I would never have believed that corn roots grow so large and spread over so much ground had some one simply told me the facts. This exhibition will cause me to stop root pruning of corn in the future". Could one have heard all the words spoken and read the thoughts that passed through the brains of those who gave no verbal utterance to them, one would surely have come to the conclusion that the state fair is truly a great educational institution and that each exhibition is worth thousands upon thousands of dollars to the state.

The horticultural display was large, fully twice as large as last year. The apple exhibit was on the whole good, but it did not make as attractive an appearance as it might have made. The tables and the fruit were not kept clean. Had more help been employed to keep the dust away, the desplay would have been much more attractive. The crowded condition made it plain that more room will be needed in the future in order to give the fruit exhibit a more attractive appearance. It must be admitted, however, in spite of the fact that this is a poor fruit year, that the fruit display was far ahead of anything that has been seen at the state fair for the past ten years.

The dairy exhibit was confined principally to an exhibition of cream separators suitable for farm dairying. This display was also much larger than last year, there being several new machines on the ground that had not been exhibited at the Iowa state fair before. The Vermont Farm Machine Company, of Bellows Falls, Vt., manufacturers of the United States Cream Separator, exhibited a small tread power suitable for running a separator, that was operated by a pair of goats. This feature attracted a great deal of attention and caused many to study the desirability of securing some power other than hand power with which to run their cream separators. The separator display in general was excellent. It afforded those who were in the market for separators an opportunity to study the different makes; to weigh their advantages and disadvantages and to decide in favor of the machine best suited to their particular conditions.

The farm machinery exhibit was about the same as usual, although a number of machines that had not heretofore been exhibited at this fair were seen. A ditching machine attracted a great deal of attention and a machine for transplanting tomatoes and plants of that character was also a new feature at the fair. These transplanting machines are used in the east by large truck gardeners, but so far they have not come into use in Iowa to any extent.

Up to the present nothing has been said about the live stock show, although as is usually the case at the Iowa state fair, it was the leading attraction. There were no less than 3,000 hogs on exhibition, which made the exhibit larger by several hundred head than last year. The cattle exhibit, from a numerical standpoint, was also larger than last year, and it was generally held that the quality was superior. The number of draft and carriage horses was also far ahead of last year's exhibition. Last year a number of large breeders had their horses at the St. Louis exposition at the time of the Iowa state fair, which made the horse show rather weak, but such was not the case this year. In fact the number of animals any one exhibitor could bring to the fair, had to be limited by Secretary Simpson in order to accommodate as many breeders as possible. The management is to be complimented for having made an effort to interest owners of American-bred horses in the fair by offering liberal premiums on American-bred stock. This will encourage home breeding of draft horses and will also have a tendency to get the average man out of the notion that foreign-bred are necessarily better than American-bred horses.

CATTLE.

There were not as many Short-Horn cattle at the fair this year as last. This was especially true of aged cattle. Young herds were present in greater numbers, and these were considered by breeders to be of much better quality than similar herds last year. The grand champion beef herd was awarded to the Herefords. The three judges that had been selected to pass on the beef herds were unable to agree as to the best herd and Prof. Kennedy, of the Iowa State College, was called to decide the matter. The Hereford show was much stronger than last year. Thos. Mortimer, of Madison, Neb., was to have judged the Herefords, but he was unable to be present, and accordingly Prof. C. F. Curtiss was asked to take his place. Prof. W. J. Kennedy judged the Short-horns; Chas. Gray, secretary of the American Galloway Breeders' Association, judged the Galloways; T. J. Wornall, of Liberty, Mo., the Polled Durhams; F. H. Scribner, of Rosendale, Wis., the Holsteins and Jerseys; A. A. Armstrong, of Camargo, Ill., the Aberdeen-Angus, and Prof. C. F. Curtiss, the fat stock.

The Gallawoy breeders were not so well represented as they were last year. Quite a number of well known showmen, who had intended to be present, did not appear. The Holsteins and Jerseys were well represented by some of the best breeders in the country. TheAberdeen-Angus show was not as strong as usual.

HOGS.

The hog show was far the largest ever seen in the state of Iowa This means that it was the largest in the United States, in fact, it was the largest show of swine that has ever been gotten together in the world. Iowa has for years been noted for the large number of excellent hogs exhibited at the state fairs, but this year every other exhibition was out-shadowed. As is usual, the Poland-China class was the largest, but the Duroc-Jerseys made a most excellent showing. In fact, the Duroc show was a record breaker for the breed. In the aged boar class 20 grand old fellows marched out for honors. Advancer captured the blue ribbon, with Aricn a close second. The yearling class was also strong. U. C. Davidson's hog, Crimson Wonder I Am, secured the blue ribbon and afterwards the purple. Crimson Wonder I Am is certainly a great hog. He is bound to carry off many more prizes this year. Boar, any age, bred by exhibitor, went to Advancer. This is a sire of many prize winners, and belongs to Johnson Bros. & Newkirk. In the six months and under 1 year class, it was a difficult matter for the judges to place the ribbons. Finally Johnson Bros. & Newkirk secured first, second and third. In the pig class Clover Wave, owned by E. Z. Russell, was an easy winner. There were 18 sows in the aged class vying with each other for honors. Iowa Belle, owned by Johnson Bros. & Newkirk, was awarded the blue ribbon. Col. F. F. Luther judged the Durocs, and he showed himself to be one of our best Duroc judges. He had a difficult task to perform, but it may be said that he satisfied every breeder on the ground. The Berkshire class was considerably larger than usual, and the quality was much better. W. Z. Swallow was the judge. He had considerable difficulty in placing the ribbon on best sow, any age. There was some criticism among breeders on his judgment on this point, but after due consideration there was general satisfaction. General Starlight carried off the first prize in the aged boar class. He was also sweepstakes boar, and, in fact, he was an easy winner wherever he competed. This boar has a great reputation and the lovers of Berkshire took great pleasure in carefully studying him. The Chester Whites were well represented. This breed was also present in larger numbers than last year.

There were some notable hog sales made on the fair grounds during the week. Jamison, of Oneida, Ill., and J. W. Hanna, of Burlington, Ill., bought a $2,000 boar; each bought a half interest in the boar. Mr. Sweeney of Webster City, sold a quarter interest in a Poland-China aged boar to a neighbor for $750, and it is said that he refused to take $3,000 in cash for the animal, this price having been offered by a company which was formed on the grounds for the purpose of buying the hog. These sales are considered by breeders to be bona fide, and they indicate the great interest that is being taken in the hog industry at this time.

GOOD WEATHER AND RECORD-BREAKING LIVE STOCK SHOW AT DES MOINES.

BREEDERS' GAZETTE, CHICAGO, ILL.

Agriculture was in magnificent flower at Des Moines last week: Iowa's fifty-first annual state fair revealed as never before the health and wealth of this basic industry. The best fruits of a marvelously fat year were offered in bewildering abundance, and nearly 150,000 visiters complimented with their enthusiastic presense and verbal encomiums.

If favorable weather should prevail during the week it was evident to the most blundering prophet that the fair would score the biggest success in its splendid history. And that is what came to pass, for climatic conditions while not flawless were about as satisfactory as Iowa affords in August. The temperature was disagreeably high on several days, but there was comfort in the ample shade which well distributed trees conferred in all parts of the grounds. Visitors thronged the live stock pavilion but they were warranted in leaving it in the heat of the day for the breezy outdoors, for this seemingly well ventilated structure at times was strangely the hottest box into which they were lured. Its motionless atmosphere, laden with tanbark dust and moisture, could not long be endured except by the fortitudinous or those provided with fans. It was different in the grandstand, where the seated (and standing) multitude could get full benefit of wind gusts while enjoying the speed ring performances. But the majority of the people were constantly shifting, as seems proper, only the hardy few sitting through any lengthy entertainment, and once they started, the grateful shade of the trees was their usual destination. Here upon the cushion of blue-grass they were revived for further explorations and sightseeing. Plenty of trees, wisely cared for, are as important on fair grounds as expensive buildings. Outdoor shade beats walled shelter in the hot old summer time, but both have their important offices and it remains for the weather gods to decide which shall render the greater service.

Rain threatened on Thursday, but, as if in league with the forces which were to make this the banner fair of a half century in Iowa, it did not materialize, and the week closed without any considerable meteorological misbehavior. Perhaps this appreciated clemency was in the nature of an atonement for the torrential inflictions of two years ago.

Monday's attendance was record-breaking for that day in the annals of the fair, about 25,000 persons passing through the turnstiles between the opening and closing hours. It was a promise of subsequent business. It indicated the wholesome sentiment of the people and suggested preparation for the biggest week the fair ever knew. For the opening day it was something entirely out of the ordinary, and it both surprised and pleased. It was Des Moines day and the city turned out with astonishing generosity. The total receipts for Monday exceeded $9,000.

Tuesday was determined not to be outdone, so it also broke the Tuesday record of the fair, witnessing the admission of about 50,000 people into the grounds and increasing the revenues by $21,165. It was governor's, soldiers' and children's day. The program was strong and the speed ring events were among the best ever seen at a state fair. Several prominent politicians made addresses.

Wednesday, postmasters' day, put on the cap sheaf, more than 60,000 people seeing the fair. This was the most successful day in the career of the institution, with one exception. It was remarked that every man in Iowa who sells postage stamps was there with his family. The time did not drag; there was plenty of entertainment programmed and it was given as promised. The total receipts amounted to $24,000 in round numbers, an increase of more than $10,000 over Wednesday's revenue last year.

State day, Thursday, rolled up about $12,000 in the treasury, distancing last year's returns for the corresponding day. It was a thoroughly satisfactory Thursday to the management and insured a surplus of about $30,000 in its coffers. Friday, traveling men's day, was not so profitable, but it paid well.

It was a fat week for the fair. New standards were set in receipts and exhibits. It was a fine reward for fifty years of work by men living and dead and a tribute to the farmer's calling.

Beef cattle and hogs are the dominant attractions of this fair. They cut a big factor in its towering success this year. Five beef breeds were shown, forming the largest exhibit ever made at Des Moines. It was as high-class as it was big. The same is true regarding the hog show. Never have we seen such a uniformly good collection of show-yard swine. The substandard sorts were in the minority. The sheep exhibit included many imported entries from flocks outside the state and these with the home-bred animals contributed by Iowa flockmasters gave this section unusual strength. The horse department was not strong in entries from dealers and importers, but the display of Iowa-bred horses was the best ever made at Des Moines.

The sale business done by exhibitors during the week was record-breaking, too. The record-breaking peculiarity seemed to be infectious. Swine exhibitors did an especially large business, and the cattlemen negotiated many good deals. The way the people attended the fair and the number and liberality of sales made at good prices indicate the throbbing prosperity of Iowa farmers and expose a widespread feeling of confidence in American commerce.

Want of room in barns and pens kept away hundreds of entries in the live stock section and many animals were stalled or confined under tents. The exhibit in this department was immense, the largest in the fair's history. And unlike most of the displays which have gone before, it was composed largely of Iowa-grown stock. More than ever before, it was a state fair this year. Herds, flocks and studs of other states were represented to be sure, but never have we seen Iowa cattle and horses out in such impressive numbers and quality. As for the hogs, nearly all of the 3,100 shown were from Iowa herds. Iowa breeders have the goods and exposed it this season as never before.

State classes for Iowa stock only have proved effective in developing this big state display. Two chances are thus had at prizes. If a Hawkeye exhibitor fails in the open class to secure a premium he may have better luck in the state class. Breeders are more likely to exhibit where there are two chances to secure at least enough money for expenses than where this result depends upon their ability to beat old-time showmen with herds and flocks of national reputation. Iowa has made a fine success of the state class proposition in that it has drawn out a big show of Iowa stock.

In the agricultural, horticultural and dairy building were seen large exhibits of superior character. We were particularly impressed with the fruit and the numerous artistic displays of corn. The Iowa State College at Ames was interestingly represented in this commodious building by corn and corn products and other grains. Poultry made a large and excellent show. The machinery exhibit was a marvel, the western side of the grounds being a maze of implements and machines, many of which were in operation demonstrating their merits.

Every event bulletined was presented on schedule time. Order and system characterized the work of every department. Judging of live stock in the pavilion began promptly on Monday morning and was practically finished by Thursday evening. Several breeds of cattle were shown simultaneously. In draft horses the breeds alternated—a class of Belgians and then a class of Percherons. Grooms and herdsmen were sometimes slow in getting their charges in the arena, and in some instances required to be hustled up by the ring marshal. So general has this practice become at a few fairs that some method should be adopted to stop it. Perhaps a rule should be fixed to this effect; unless every animal is in its class within a specified time after the marshal's summons it will be debarred. Such a regulation would be in line with the strict business principles which progressive fair managers are following. For most of the shortcomings in any department there is a practical remedy, but in some cases it seems a little unpleasant to apply it.

Altogether, the work of the judges in the live stock section was very well done. Men were selected who have the experience and character to acquit themselves with credit, and this is what they did almost without exception.. Some exceedingly difficult classes were up for adjudication in several breeds of cattle, sheep and hogs, and there was ample opportunity to make decisions which could be overturned or sutained with equal warrant. Perhaps the hardest nuts to crack were exposed in the Angus competitions.

The work was about equally divided between practical breeders and professors. The admirable work of the latter did not lend any encouragement to those who imagine that college men do not know how to judge stock because they are not "practical breeders". We guess that the day of the chronic knockers on professional judging, which admittedly has been very bad now and then, is gone never to return. Scientific education does not unfit for practical performance. It has taken several years to ground this truth in some agricultural sections. The fact is, as between the college professor and the breeder as judges of live stock experience seems to show that so far as results are concerned, the one gives as good satisfaction as the other.

The trolley line and the Chicago, Rock Island & Pacific Railway improved their reputation in hauling the crowds to and from the fair grounds. The service was materially better than last year. Especially commendable was the train service. Trains of six to eight coaches were run every ten minutes each way between Des Moines and the grounds. The capacity of eight coaches makes a big hole in a crowd. It took about ten minutes to make the trip on the train, and from 30 to 103 (we kept time on one trip) on street cars. On several occasions the electric cars could not get the necessary power for regulation speed and just as often they were delayed by accidents. They were always crowded to the limit.

For handling fair crowds there is absolutely no comparison between the steam and the electric car. Wherever a comparison can be made this is the inevitable conclusion. The transportation problem will continue to press for a satisfactory solution at the big fairs like Iowa, Minnesota and Illinois.

A number of night attractions drew big crowds and made a lot of money for the fair. These consisted of a vaudeville show and a spectacular fire works display secured in "The Siege of Port Arthur". The grandstand was comfortably filled for each evening's performance. The nocturnal attractions were put on the first of the week and continued until Friday night. Effort will be made to secure a larger and better class of night entertainments for next year, the management having satisfactory evidence that the people will support such features.

It was impossible for the crew of 18 men to keep the grounds free from waste paper, pasteboard boxes and other debris during the fair. A cleaning was made every afternoon, but the spread of luncheons the next obliterated the shady places as lavishly as ever. Iowa people bring their luncheons with them to the fair and do not save the paper and boxes left after the repast has been enjoyed.

Iowa farm folk have the state-fair-going habit. Going to the fair has come to be an annual picnic outing with them. Reduced rates are granted on all the railroads in the state, and Des Moines is a very accessible point from all parts. Every day has attractions of special interest to certain people. This secures a distribution of the immense crowds. A children's day, old soldiers' day, a state day and the like give an idea as to the manner of featuring the fair. Marked success has attended the operation of this method.

Visitors get their money's worth at this fair, and when they leave it is nearly always with the hearty promise to return the next year. They are entertained, enlightened and set to thinking. A valuable experience is added to their careers. Larger interest is developed in their own business as a result. They feel that the time and money have been profitably spent. From every point of view the experience is advantageous, and they are enthusiastically in favor of repeating it the next season. Farmers attend with their families. There is just as much to interest the farm women as the men. This explains how the Iowa State Fair can roll up an attendance of more than 150,000.

A famous Italian band was in commission throughout the week in open air, giving a continuous concert. The music was the best that any band has furnished on these grounds. It is wonderful how band music attracts. There was always a big crowd surrounding the musicians and the listeners remained hard by for hours.

We are glad to record that band music was dispensed with in the judging pavilion, where last it kept high-strung dairy cattle in a state of fright and exasperated everybody within hearing of its scandalous noise. The bandstand in the pavilion this year was occupied by a ladies' orchestra which discoursed highly praised music. It had a soothing rather than an irritating effect on man and beast and was a welcomed substitute for the tin-shop din which emanated from that quarter last season.

Although an immense institution, with a strong grip on the good will of the people. the Iowa fair has merely laid the foundation for what it is destined to be in years to come. At two score years and ten it is but a husky youth in comparison with its older self.

Henceforth a new policy will be pursued in constructing buildings. The ramshackle wooden buildings which now cumber the grounds and inadequately and unsatisfactorily serve their purposes. costing heavily each year for repairs. are monuments to the futility of erecting ephemeral structures. They have sufficiently impressed the idea that fair equipment should be permanent. Steel. concrete. stone. brick and tile will enter into all buildings now contemplated. Only two of this construction are in evidence at present—the live stock pavilion and the agricultural. horticultural and dairy building. The decaying grandstand is a dangerous pile of lumber. a veritable fire trap, and several other main buildings, to say nothing of the cattle, horse, swine and sheep barns and pens, are unsafe from the standpoint of fire, too small and capable of only a short-lived service at best. None of them typifies the solidity and security of Iowa agriculture.

The Gazette is not criticising but commenting; these temporary buildings had to be and they have fulfilled their mission nobly. The tent precedes the frame, the latter goes before the stone mansion. Only those institutions which have been established in recent years could start with stone, as at Sedalia. The Iowa fair was born in the wooden age and must be rebuilt of indestructible materials. This is the programme which the management will carry out as rapidly as funds permit. It will ask the next legislature for an appropriation to cover the cost of erecting a steel grandstand capable of seating 20,000 people, and costing about $40,000; a $50,000 swine pavilion, an administration office costing $20,000 and $10,000 for covered walks and pavements. For these additions to the equipment there is urgent and immediate need. Iowa legislators, many of whom attended the fair and know what it should have, will reverse their former treatment of the institution if they do not grant, with unanimous enthusiasm, every cent solicited by the management. Iowa's agricultural position requires that it shall lead in matters of this kind. Of all states it is the last that should pursue a cheese-paring policy with reference to the development to the development of its fair, experiment station and agricultural college. The campaign for a state fair appropriation is on, and if every farmer will lend its support success is certain. And nothing succeeds like success.

A large degree of success was achieved by the new press bureau in collecting accurately and issuing to representatives of the press the awards in the live stock section.

It is growing more and more important for each state fair to have a press bureau with sufficient organization and ability to collect accurately and report promptly and correctly the awards in all departments. It is the duty of the fair thus to serve the public through the press.

Objectionable side-shows and low-grade attractions were conspicuously absent this year. A moral atmosphere pervaded the grounds. The day of fakirs at state fairs is gone. Iowa has set an example which is worthy of emulation.

Wonderful has been the development of this mighty institution. Motived by a healthy interest in the farmer's calling, environed by a land of prodigious fertiliy and constantly stimulated by popular approval, it has kept apace with the nation's progress. From an obscure Lilliputian it has grown to be a conspicuous Hercules, exerting his strength in the interest of the world's most vital industry.

Every year has increased the magnitude and scope of this fair. Progressive improvement has characterized it career. Especially marked has been its upward trend in recent years under aggressive, practical business management. The dawn of a new era in agriculture has aided it heroically, and the rising tide of national prosperity has quickened it, but to intelligent administration is due in large measure the robust health which this useful state institution enjoys. Because it has benefited America's foremost agricultural people, they in truth reciprocity fashion have supported it nobly. To educate, inspire and entertain; this is its trinal motto. What the fair has cost and may cost in future long ago was paid. Not in years has it secured payment in advance for service rendered. If it now asks for funds they are of right due it, and with interest. A public institution of this character has an actual earning capacity aside from that inhering in its own efforts. It makes money for the state. It multiplies its talents and is worthy of more.

STATE FAIR MARKS A NEW ERA IN IOWA.

A Comparson With The First Fair Held Half a Century Ago Shows Wonderful Advancement Made by Hawkeyes.

C. C. CARLIN, IN TWENTIETH CENTURY FARMER.

The Iowa State Fair, held at Des Moines during the week ending September 1, marks a new era in the growth of that state. The fair ground was a magic city, where half a century since there existed only an expanse of land (which might has all been bought for less than the price of a single acre of it today), covered by an almost impenetrable growth of trees and frequented only by denizens of the wilds, there was set down, as it were, in a day a consolidation of all the great and diversified industries of an empire. It was a fairy land, where at touch of the magic bell, there came forth all the wonders of nature in her most wonderful moods, and all the results of the exercise of man's inventive genius and skill; where the fruits and flowers of the tropics spread their profusion of perfume over the less favored varieties of the far north; where the crude implements of the pioneer modestly gave way to the models of perfection in labor saving devices that have placed the occupation of the farmer on a level with those of his city brothers; where the craft of the manufacturer in his wonder working productions, is equaled by that of the fine stock raiser in bringing about such perfection of animal form and character as to seem marvelous, and where 60,000 people, with all their perversity and diversity of interests, might each, in a single day, find some point on which to direct his attention.

The Iowa State fair has grown into an annual exposition of the products of the state that is a bewildering collection, the greatness and number of which make it impossible to give the whole more than a passing view. Indeed, it has become a common practice for the visitor to devote his entire time to these special features with which his interests might be connected, and to go home in ignorance of its many wonders that are equally important to some one else.

Truly, it was a great show, an honor to the commonwealth from which it was gathered, a credit to the men through whose industry and intelligence it was produced, a source of pride to every resident of the state, and a monument to the perseverance and business sagacity of the small circle of men who, as managers, are responsible for the success that has been attained.

Half a century ago the first Iowa State fair was held, and a comparison of that occasion with the great exposition of the present year will, in some measure, show the strides that have been made in improvement and development. The premium list of the fair of 1854, in the live stock department, was somewhat crude from the standpoint of the present day. In cattle Durhams and Devons were the only breeds for which prizes were offered. There were no registry departments and the two sorts were competitors in the same classes. Then there were classes for "natives and grade," "oxen," "beef" and "milk cows." The horses were shown in classes of "all work," heavy draft," "jacks" and "blooded," the latter having reference to thoroughbreds, and this was the only instance in the entire fair where there was any requirement as to purity of blood. Sheep were shown as "long wools" and "fine wools." Hogs were "swine" only.

The poultry show called for "Shanghai, Dorking, Poland, Black Spanish, Cochin, China, Chitigon, natives or dunghill". Turkeys, geese and ducks were shown, but no breeds named. Prizes were offered for hams cured by exhibitors and for "five acres of Indian corn". History throws no light on the number of animals competing, but we are told that at the fair of 1856 sixty-one hogs were shown and sixty-three cattle. At the latter show the premium list called for Shorthorns and Devons, and they were shown as different breeds. It will be seen that the purebred live stock industry of Iowa, which today stands second in importance to that of no state in the union, as evidenced by this great exhibition, is the growth and development of less than half a century.

In the show of 1905 we have 599 cattle belonging to eight different breeds, and as many horses belonging to five breeds, 2,415 hogs belonging to four breeds, and hundreds of domestics fowls of modern and improved varieties.

IOWA FARMERS SUPPORT ANOTHER GREAT STATE FAIR.

THE PRAIRIE FARMER, CHICAGO, ILL.

It is a wholesome sign of the times when about 150,000 people attend a state fair in five days. That is the record made by Iowa this year at Des Moines. There inheres in this fact nutritious food for reflection. Those who look beneath the surface would say, perhaps, that such liberal support of Iowa's fifty-first annual state fair indicated at least three important things: prosperity among Hawkeye farmers, appreciation of agriculture educational agencies and an unusual degree of state pride as well as fine loyalty to state institutions. The truth is that one need not investigate beneath the surface to discover these conditions; they are apparent to the most casual observer. Their luminous existence indeed made it possible for the fair to score the record-breaking success which we shall note.

Iowa is a farming and live stock breeding state; this fact was in impressive evidence at the fair, and agricultural statistics annually published buttress it. Yet Iowa agriculture is fairly well diversified as shown in the exhibits at Des Moines. Corn, pork and beef are by no means the only, although the chief, products of Iowa soil. Fruit is grown with good success quite generally, poultry raising is a giant industry and an enormous potato crop annually is produced. Moreover, dairying is a strong adjunct to general farming in many sections. Bee culture also is conducted upon a considerable scale. Altogether, considering the adaptability of the soil to the production of corn and oats it is somewhat remarkable that diversified farming has gained any footing in the state.

In every sense the fair was a state institution, more so than we have ever found it to be. In no department was this more evident than in the live stock section, where Iowa-grown animals constituted the great bulk of the admirable display. Outside herds, flocks and studs were excellently and generously represented, to be sure, but not in numbers seen at previous fairs. State classes for cattle and sheep have proved effective in bringing out big exhibits from Iowa breeding farms. Exhibitors making their initial appearance in the show-yards take very kindly to the plan which enables them to get two chances at prizes. Beginners usually have a special eagerness for at least sufficient prize money to defray their expenses, and the Iowa fair managers seem to regard it as quite proper to give them opportunity to secure it.

Monday, Tuesday, and Wednesday were record-breaking days, each of them, so far as attendance and receipts are concerned. Thursday was up to the standard, and Friday paid well. Altogether more than 150,000 people saw the fair, and the management found a surplus in its treasury at the end of the week amounting to more than $30,000. It was the banner year from a financial point of view, and the exhibits likewise set new standards in all departments save the horse section, which, while not weak did not attain to former marks. Visitors did not sweep down upon the fair in one day, but the crowds were well distributed through several days. It was therefore possible for Des Moines and the transportation lines between the city and the fair grounds properly to care for the people. Congestion of cars, streets and hotels surely would have resulted if the one-day idea had been followed, but as it was everybody could be reasonably comfortable.

The writer has always been impressed with the system and order which distinguish the management of this fair. Catalogued events are presented on time and at the place designated. There are no delays or hitches in the carrying out of the bulletined programme. Visitors know when and where to see a particular performance or feature of the fair. Each day has its special attractions appealing to certain people. Each day is featured. This helps to make it a six-day fair instead of a briefer show. Business management tells in fair administration. It has been responsible in large measure for the wonderful growth of the Iowa fair.

About 700 cattle were shown, embracing five beef breeds, two dairy breeds and one of dual-purpose breed. Short-horns led in numbers and made a strong state exhibit. Angus were next in numerical standing, and in uniformity were, perhaps, ahead of the other breeds. Herefords were contributed largely by outside breeders, professional exhibitors in fact, and the Galloway show was composed of home-bred and outside entries in about equal numbers. Four herds of Polled Durhams were shown, the first ever exhibited at this fair, as hitherto no classification has been provided for this breed. Red Polls were shown by three breeders, Jersey by six or eight and Holstein Friesians by three breeders. Quite a creditable showing was made of pure-bred and grade fat cattle.

Hogs numbered 3,100 head, with Poland-Chinas in the lead as usual, Duroc-Jerseys being a close second. Chester Whites ranked third in numbers and Berkshires fourth. It was commonly remarked that the "reds" made the strongest showing in this section. The white hogs also made an excellent presentation of their merits. Accommodations for these porcine visitors were greatly overtaxed. Pens were sadly inadequete for such an overwhelming collection. No department is in greater need of improvement than this. Not only was it overtaxed, but we were informed that at least 500 hogs were kept away owing to lack of room. The judging was done outdoors, and if the weather had been what it was two years since at Des Moines a nasty mess would have developed. Fortunately the weather was almost ideal throughout the week.

Only two of the buildings on these grounds are of permanent construction; all others are of wood and cost heavily for repairs each year. They are old, inadequate for the purposes intended and look out of place in sight of the big live stock pavilion and the big building devoted to agricultural, horticultural and dairy displays, both of which are of permanent construction and thoroughly up to date.

Sheep made a stronger exhibit in quality and numbers than ever before, all the mutton breeds being well represented. Prof. W. J. Rutherford of the Iowa Agricultural College, who judged these classes, pronounced the exhibit the best he had ever seen at Des Moines. Iowa flockmasters were out in stronger array than hitherto, the state classes attracting them from all parts. Draft horses were forward in ragged classes. Old time interest in this section seemed wanting. The little Shetlands had the lion's share of public attention, and the biggest display ever seen at a state fair was the verdict after the diminutive horses had finished entertaining the swarms of children in the pavilion.

Poultry set a new mark; more birds were shown than heretofore, and the character of the display was considered above any of its predecessors. Never was a larger or more comprehensive exhibit of agricultural machinery seen at a state fair than occupied acres in the western part of these grounds. It was marvelous in its variety and completeness, an education in itself, the labor-saving idea presented with great effect.

Ornately artistic displays of corn were conspicuous in the agricultural building, liberal prizes being offered for them. Most of the corn on exhibition was of last year's growth, though a small lot of early varieties of this season's crop was in evidence. A bumper yield is expected in Iowa, and nearly everywhere else in the corn-belt this year. Those who do not think of Iowa as much of a fruit state would change their mind on seeing the rather elaborate exhibit of autumn apples in this building. Peaches, pears, grapes and plums also made an excellent impression. Quality loomed up as the chief characteristic of this luscious assortment of fruit. Near it the Iowa Agricultural College had a varied display, consisting mainly of corn and products shown in glass jars. It was calculated to interest the people in the work of that progressive institution of learning. Garden and field products of the usual sorts were big and showy, potatoes of numerous varieties suggesting a fine output of "murphies" this year in Iowa. Dairy machinery and apparatus occupied their usual space in the building, and the dairy display itself was about the same in character as that of last year.

The fair was clean; fake side shows were absent. A moral atmosphere was present. Farmers could bring their families with confidence that the management had prepared a thoroughly good agricultural fair, clean and high-class, worthy of their presence and capable of entertaining, instructing and inspiring.

AGRICULTURAL FAIRS.

DROVER'S JOURNAL.

Agricultural organizations date back to the day of Washington, Jefferson and Adams, who were largely interested in the agricultural developments of the United States. Washington advocated a national fair association with state auxiliaries. State agricultural societies were advocated during Washington's administration and fairs subsequently held in different sections of the country. The first fair was held at Washington, D. C. in 1804. The premiums distributed for the exhibit of live stock and farm products were $100, which was apportioned to the several departments of the exposition. The Columbian Agricultural society held a fair in 1810 for the promotion of rural and domestic economy at Georgetown, D. C. There were large exhibits of fine wool sheep at this fair.

In 1816 the Massachusetts Agricultural society gave a meeting at Brighton at which one of the leading attractions was plowing matches by ox teams. These contests proved of great advantage to farmers, as better cultivation of the land was stimulated. At subsequent fairs it became a feature to have leading agriculturists address the farmers on husbandry.

County fairs were slow of development until about 1840, after which their organization was characterized by much energy and frequency. At the present time upwards of 2,000 agricultural fairs maintain organization in the United States.

The fairs of to-day are the evolution of agricultural education. When properly conducted they become important mediums for the dissemination of agricultural knowledge. The tendency of farmers is to seek information that leads to the betterment of agriculture. The aspiration for increased knowledge of husbandry is evidenced in the enlargement of the number of agricultural schools and experiment stations. The tillers of the soil are looking for practical information on the science of improved husbandry.

The state fairs measure a high standard of excellence in agricultural and are of vast educational importance to the farmer in the prosecution of his work. It is the ambition of the managers af state fairs to meet the expectation of farmers in arranging and exhibits of the best stock and products of the state, and in the sweepstake classes to secure an exhibit of the best live stock in the country.

The helpful educational features of fairs should be the paramount desideratum. All that appertains to scientific agricultural in machinery, land cultivation and agricultural products should be made prominent at fairs.

WHAT THE STATE FAIR MEANS TO THE FARMER.

ALSON SECOR, IN TWENTIETH CENTURY FARMER, 1904.

In giving a brief review of the Iowa State fair all detailed description of exhibits will necessarily be omitted. Just as well, anyway. The readers who saw the great fair need no such description, and those who did not attend the fair would not be benefited thereby.

It is our purpose to tell what the state fairs mean to the farmer, and if possible arouse enough interest in the nonattending readers that they may attend the next fair, or show the unobserving readers who did attend what they should see when they go.

The fair this year was a fitting celebration of its golden anniversary. The weather was perfect for such an event and the attendance was the very best. The exhibition as a whole was equal to any ever shown.

Iowa has finally become aroused and is making such permanent improvements on the grounds as befits the greatest agricultural state in the union. Last year a fine new stock pavilion was dedicated, and this year close by stands a splendid new agricultural hall for the exhibition of agricultural, horticultural, and diary products. New brick walks are marked improvements.

The association made money this year and no doubt other improvements will grace the grounds another year. Larger amphitheater capacity is much needed. It is a shame to pay for a seat to see the races and other entertainments and be compelled to stand up all the afternoon. Hundreds of people would gladly pay for a seat in the amphitheater if they were sure they could sit after they entered. They prefer to stand in the hot sun and look over the track fence, or sit on the steps of nearby machine halls than pay for a seat in the shade and then stand in jam.

The street car company handles the crowds nicely. They have also made some important improvements in the grounds. But so long as men exist they will be in a hurry and crowd like sheep. They stampede without cause. Nothing short of lightning speed in getting home when they once start suits the rushing Americans.

Strange But True.

'Tis strange but true that the railroads do not make any extra effort to handle the increased traffic of state fair week. They seem to feel that they do their duty when they reduce the rate for the great event. What does it matter to them if men, women and children stand in the aisle for hours after they are already excessively wearied by one or two days' tramping through the fair grounds? Farmers would not allow overcrowding of hog or cattle cars; they must put up with the overcrowded passenger coach, where health and strength of men and women are sacrificed to corporation greed. Thousands stay at home for that very reason.

But standing wedged in the aisle for hours in both going to and returning from the Iowa fair, we got there, saw the great show and finally landed safely at home, a wise and weary man.

Was it worth the strain—was it worth while? Yes. The live stock exhibit was fine. The cattle show best yet. The horse show was not up to par because of the horse show now on at St.Louis.

It is good for a man to go and see the magnificent specimens of live stock shown at a fair. He goes home with a determination to grade his scrubs up a little. It's a fine place to see what breeders have for sale and a good place to buy a thoroughbred to start with.

The display of fruits, grains and vegetables was good, though necessarily some specimens were immature because of the lateness of the season and the earliness of the fair. It's a good place to learn something. The farmer looks at the big fruit and asks the grower how he gets such big apples. He can't raise them—same kind, too. Well, he learns that the exhibitor takes care of his orchard. He learns why his orchard is a failure and goes home with a new inspiration.

Best Dairy Exhibit Ever Shown.

The dairy display was the best ever shown. State Dairy Commissioner Wright said the state was getting aroused along dairy lines. A system of district buttermakers' conventions and dairy men's picnics is having its effect upon the quality and quantity of Iowa products. In spite of the fact that Iowa is a corn state, a great beef state, a state that does not show more than a handful of dairy cows at the fair, "Iowa, my Iowa!" is the greatest butter state in the union by far. Iowa with its scrubby, beefy, duel purpose cows, can make butter just the same. What it will do when Mr. Wright and his able assistants get the state thoroughly aroused along dairy lines can only be surmised.

Over in the old Agricultural hall the roosters were crowing in solos, duets and choruses, and the hens sang on the refrains..

Why shouldn't they crow! Iowa is the greatest poultry state in the union.

At the poultry show the farmers' wives have their say. They tell you what's what about chickens. They have that job on the farm. How they would praise a fine specimen and how scornful was their comment upon a poor sample. Really, some were very poor samples. Scabby legs, pale combs, bleary eyes, lousy heads and general debility indicated that they should not be allowed in a show. But that's where the farmer has a chance to see what breeders have good, clean, healthy stock, and he should place his orders accordingly.

There Are Lessons Galore.

Down in the machinery quarters there were lessons galore. This is an age of machinery. The farmer no longer uses his brawn to any great extent. There are implements, machines and contrivances whereby he may save time, labor and money in his work. But the farmer who stays away from the state fair is not aware of the new helpful things that await his purchase. Gasoline engines of many makes were there in great numbers. These engines are found on all up-to-date farms. The windmill swings idly on its bearings while the gasoline engine pumps water, grinds feed, etc. The merits of the different engines can be compared on the fair grounds. The traction gasoline engine has come to break the steam engine union. Lighter in weight, costing less at first cost, and costing less to run it, doing away with the water and coal wagons, skilled engineer, and costing nothing while not actually working, the gasoline traction engine should interest the farmer as well as the thresherman. It stands the farmer well in hand to get posted on this subject. He may save money when he threshes.

There were many new things in gates and fences that it pays to investigate. Just because the heavy board gate has done well is no reason why there is nothing better.

The farmer no longer has to shovel his grain out of his wagon by hand. What a backache it makes! He can get an elevator that will dump his load and put it into the bin or crib in no time, and fill both fuller than by hand shoveling. Maybe you didn't see those things. They were there.

Many men will cut corn with a binder this fall. As usual the stubs will stand about a foot high. These stubs will extract profanity from your lips as you stumble over them shocking corn. Those stubs will be there when you plow and cause trouble. But I saw an attachment at the fair that can be put on the binder and cuts those stubs close to the ground so they will be out of the way and sooner become rotted.

These are but hints of the many useful things the farmer can get a chance to investigate at the state fair.

Everyone Sees the Races.

After all has been said concerning what the farmer may learn, what he ought to see at the fair, we must confess that there is but one thing they all see when they go there. Everyone sees the races. What there is about it that so universally attracts is beyond our comprehension. The farmer does not raise race horses; he has no use for them on the farm. But somehow he wants to see the race. He will stand all day in a frying sun, stick his toes through the picket fence to catch a crossrail, lean over the pickets and yell himself hoarse to see the horse race. The great amphitheater, seating 5,000 or 6,000 people, was crowded with over 8,000 crazy specimens of humanity on Thursday, and every foot of space around the track, inside and out, was packed with some more of the same breed, just to see Dan Patch spin around the track. Each person could only see the horse for a few rods, and the whole thing lasted but a few seconds, but that crowd stood all the afternoon to get sight of a horse that had a record. Can't understand it.

Besides the races by professional race horses, there were some interesting contests between fire company teams. Jack and Jack, supposed to be the fastest fire team, received their share of applause. Speed is put to good use when hitched to a fire wagon.

The acrobatic preformances of the Dunbars and Japanese troupes were very entertaining. There were feats of skill and daring that made one's heart stand still. There were feats of strength and coolheadedness that were worth going to see. The farmer boy thinks he's pretty clever and strong, but after seeing those men do with ease what seemed impossible, he no doubt has less conceit. It shows what constant training can do for a man. If the farmer would take as much pride in doing a little better each year agriculture would make rapid advancement.

It is worth while to attend the state fair. Every farmer should make an effort to visit the one nearest to his home at least and every citizen of Iowa should support the Iowa State fair.

THE STATE FAIR.

Twentieth Century Farmer.

The season of state fairs is now before the people. That they are a means of great advantage to the state in their opportunities for the exposition of products and industries that represent the natural and acquired resources of that particular state, section or district of country no one will question or deny. The people of the entire civilized world are becoming more and more a people of education, of research and investigation. The tendency is to travel and be instructed by the object lessons that are constantly presenting themselves to the eye. It is through this very valuable organ that we are brought to a realization of quality, of differences in the composition and general make-up of articles, which adds attractiveness in exhibition.

The state fair is a state enterprise that should merit the attention and support of every citizen in the state. State fairs are largely made up of contributions of time, thought and labor from among public-spirited citizens. The exhibitor is a public-spirited person. Premiums seldom, if ever, pay the expense of money expended, time, labor and attention given the growing and preparation of the article or animal exhibited. There must be, and is, a contribution by the Exhibitor. It is the product of pride and ambition to make his state fore-most in the estimation of visitors and sightseers. There is a home pride, a self pride, in the bosom of every loyal citizen that places his state high in estimation and honor. This is just as it should be and the more of this spirit that is instilled into the people and encouraged to manifest itself in work, the better the state fair will be, and the greater the general prosperity of the whole commonwealth will become as a result of these conditions

Missouri during the past week closed a successful state fair. This association has met the indorsement of the citizens of the state. It has been backed up by the most liberal assistance in state appropriations for buildings and equippage in exhibition facilities. While wet weather interferred to some extent with the attendance, this is viewed as only a temporary circumstance and its management will go ino the preparation for 1906 with renewed earnestness and zeal to make the state fair better in all respects each year.

Iowa has its state fair in operation this week and in matter, exhibits and preparation for a successful show surpasses all past history. Iowa's state fair is one of the big state fairs of the United States. It is in the contest for supremacy and states entering the race with Iowa must move forward at a rapid pace.

THE MODERN AGRICULTURAL FAIR

ITS ORIGIN, DEVELOPMENT AND POSSIBILITIES FOR THE FUTURE.

Discussed by G. W. Harvey, in Twentieth Century Farmer.

The beginning history of the organization we term the agricultural fair, dates back into the eighteenth century, when the primary purpose and use of the fair was the barter and sale of articles of merchandise and farm products. Under this system of observance and when the ordinary means of communication between countries were very limited, fairs were of great use in the exchange of commodities.

In Europe they appear to have originated in the church festivals which were found to afford convenient opportunities for commercial transactions, the attendance of people being such as took place upon no other occasion. Some of these festivals, from circumstances of place and season, speedily acquired a much greater commercial importance than others, and began, therefore, to be frequented by buyers and sellers, even from remote parts of the world. Princes, magistrates and governing authorities of cities found it to their advantage to encourage them and many privileges were thus granted.

At a later date, when the convenience for travel had improved, when more populous towns had come into existence, with their dealers in miscellaneous wares and other evidence of advancement in trade, the necessity for the ordinary class of fairs seemed to have passed, and in many cases they degenerated into scenes of merriment, such as was found at Bartholomew fair, London (long since extinct), also Greenwich fair, Glasgow fair and Donnybrook fair near Dublin. The boisterous merriment of these fairs were of the old devices employed as most likely to attract a greater concourse of people, hence each fair had its sport designed to be best adapted to its attendance; foot ball, wrestling, jumping, sack races, soaped pigs, wheelbarrow races etc.

At a still later date many of the British fairs are found to have been almost exclusively in the interest of the purchase and sale of live stock, both improved breeds and animals to be sold to the feeder to be fattened for the butcher.

The first step toward organization for the encouraging and forwarding of agriculture in the United States was in the organization of the Philadephia society for the promotion of agriculture in 1784. A similar organization was formed in New York in 1791 and in Massachusetts and South Carolina in 1792. At this time there was but little conception of how such societies were to be operated. They represented a new enterprise, both in this country and in England, where at this date they were just begun. The first proposition was to place the boards under government management and assist them by government aid.

Washington was greatly interested in the subject and was a member of the Philadelphia society. He, John Quincy Adams and Thomas Jefferson were practical farmers on a large scale. Arthur Young and Sir John Sinclair of England were active participants in agricultural organization at this time and in matter of information were esteemed authority. These gentlemen suggested the value of a national board fostered by government appropriation. Washington's idea was the formation of smaller societies which would be auxiliary to the greater one. Upon this basis societies were organized and continued to be organized in the states with varying results.

The first agricultural fair held in this county was at Washington in 1804, at that time descibed as "a city in the woods". The premium incentive at this fair for the exhibition of choice produce and live stock was $100, which was apportioned in the various departments.

The next fair was held by the Columbia Agricultural society for the promotion of rural domestic economy at Georgetown, D. C. This was held in 1810 and large premiums were offered, especially on sheep and wool. Bezeleel Wells of Stubenville, O., was a prominent exibitor at this fair of the Black-Top Delaine Merino sheep, a well known type of sheep at our present day fairs.

In 1816 the Massachusetts society held a fair at Brighton, where premiums were offered for a plowing match of trained ox teams. These fairs excited much rivalry and a spirit of contest rapidly developed, as well as the advantage of acquiring hints for improvements in methods of work. They were also commented upon as good advertising mediums for the breeder of good stock, resulting often in a rich harvest in sales.

At many of the fairs addresses were made by prominent agriculturists on topics calculated to interest and instruct the people; also papers were read which were collected and afterwards printed for the benefit of the public.

For the first forty years of the ninteenth century the organization of county and state fairs was not marked with much energy or frequency. But the period between 1840 and 1850, state and county fairs were numerously formed over the country, and since that time scarcely an agricultural district within our national limits have been without the county or state fair, until at the present time no less than 2,000 active agricultural fairs are in organiation in the United States.

The agricultural fair of the present day may very prudently be termed the legitimate offspring of agricultural education. The tendency is to seek information for a bettering of farm conditions, everywhere, throughout all districts where agriculture forms a part of the business interests of the people. This desire for agricultural knowledge and training may be seen in the increased number of agricultural schools; in the disposition of our citizens for increased appropriations for the maintenance and better equipment of these schools; in the rapid growth of the farmers' institute, which has become in a measure the local agricultural school of the community or county in which it is organized; in the introduction of the elementary principles and the study of agriculture in the public schools. The tendency throughout seems to be for more knowledge on scientific and practical grounds. In no other occupation or profession is there so much interest manifest from among the common people. These evidences of increased interest in agriculture stimulate a disposition to rivalship among producers, and the agricultural fair is the recognized medium, though which the ambitious tiller of the soil and the stock grower finds consolation in publicly demonstrating the merits of their production and fruits of their work. Thus we find the agricultural fair has become a necessity before the pressing demands of the breeder and producer in his efforts to fill the requirements that agricultural education has, and is making, for these object lessons that the agricultural fair so perfectly and satisfactorily supplies.

The state fair of the twentieth century measures a higher standard of excellence in moral influence and educational ambition than has ever been previously obtained under agricultural organization.

The agricultural fair of today is as distinctly a part of the agricultural education of the country as are the influences which make it possible for a fair to be held and meet the indorsement of public sentiment. It is the ambition of the managers of the modern state fair to meet the expectations of the people and satisfy the demands for a higher class of exhibition and entertainment on the fair grounds. The successful management of a state fair is too frequently estimated upon its ability to make money, regardless of the protection it offers its patrons.

The present tendency among state fairs is to permanency of location, the beautifying of the grounds, by nature's adornments and landscape gardening, the building for the future and the keeping of these grounds free from the contaminating influence of vicious and immoral shows and concessions. The high moral standing of the state fair makes it worthy the guardianship it has assumed in the exhibition, care of agriculture and its kindred interests and industries.

The contemplated introduction of a higher class of entertaining features in the line of amusements for state fairs, resulted in the organization of a western state fair circuit last winter at Des Moines. This association, as soon as it gets into working condition will be able to arrange for special free attractions of a highly entertaining character, that could not be had for a single engagement.

HIGHER CLASS OF ENTERTAINMENTS.

The day has gone by for the cheap side shows at the state fair. The people demand more in advantages for recreation and amusement and this calls for the state fair auditorium and theater, where the tired visitor may rest under the influence of good music and instructive talent.

With the fair visitors the great central attraction is what he is most interested in. It may be live stock, farm products, fruits, machinery, dairy, bees and honey, mercantile display, fine arts, or the race horses on the track.

The race horse has been the means of creating more contention in the agricultural fair than all the other influences combined, and yet he is a legitimate factor in agriculture, when properly credited and given his natural and inherited rights as a free and untrammeled animal.

The strictly agricultural fair is advocated by a class of fair patrons as being the only legitimate exhibition, and therefore the only feature that should receive encouragement from the fair management. The horse race is condemned as vicious and damaging in its influence on the fair visitors. The encouragement for betting and gambling is urged as a reason why this source of amusement should be excluded from the fair. Cruelty to dumb brutes is sometimes set forth in the attempt to make a case against the encouragement of the speed attraction on the fair grounds.

Race track gambling, where the horse is used as the medium for carrying it on, has nothing whatever to do with the exhibition speed attraction of the agricultural fair. It is proper to encourage the speed feature in horse breeding, because there is a legitimate purpose, use and demand for active, smart driving horses. They are needed for saddle and light harness use, and the breeding of these horses is a proper and legitimate industry on the farm. The racing feature is an entirely different proposition and has no direct connection with the agricultural fair. Neither the horse nor the breeder of the horse is responsible for the use to which he is put.

The educational feature of the fair should never be lost sight of by the fair management in its attempt to amuse and entertain. The building of a fair that will at once appeal to the finer sensibilities of the educated and the learned in science and art, is the demand of the times, and should be the aim of those having this work in charge. More refinement, more taste, more artistic display in decoration and the placing of exhibits is the demand at the state fair, and every effort to supply this refining influence should be exerted.

EDUCATIONAL FEATURES OF FAIRS.

This refining influence is not confined to any department or division of the fair and should not be. Throw out the proper encouragement by providing neat and well arranged grounds and buildings and the exhibition artist will bring every feature of display up to it.

The work of the artist is not alone found hanging on the walls of the beautiful and finely decorated buildings on the fair grounds, labeled "Fine Arts", "Mechanical Arts" and "Textile Fabrics", but in the live stock barns as well, the artist has been at work, where are found the fine, glossy swine, finished more beautifully than the pencil of the master painter can picture. In the cattle stalls the same artistic work of the caretaker and scientific feeder are observed, as the massive duke or prince of the herd, stands at the head, the proud progenitor of a long line of successful prize winners. And the great, matronly cow, a no less prominent figure in her relation to the show herd, stands quietly by and unconsciously defies the picture maker in adding one more touch of the brush, or the perfecting of a single line that will make her more acceptable in the eye of the critic.

The state fair is a presentation to the public of the work of a great aggregation of artists and scientists, who come from the farm, the feed yard, the orchard, the factory, the work shop, the home and the school. The best of everything is collected into the show rooms and this great state exhibition at once becomes an institute of learning, a school for the eye, the ear, the heart. Men and women are made better in knowledge and better in spirit by attending a good agricultural fair, conducted upon a basis of education and morality.

THE FARM BOY AND THE STATE FAIRS.

WALLACE'S FARMER.

The state fair season is now on us, and thousands of farm boys into whose homes Wallaces' Farmer comes will visit the various state fairs, many of them for the first time. We have a very vivid recollection of our first visit to a state fair more than fifty years ago, and it is fair to assume that the boys and girls attending state fairs for the first time this year will have similarly vivid recollections fifty years hence.

There is so very much at a state fair that is entirely new to the ordinary farm boy that he is apt to miss the best part of it. In fact, his first visit is quite likely to be given over to getting a general idea of the fair, its strange sights and sounds, and he is not to be censured if he does not give close attention to any one particular thing. There is too much to be seen to see anything accurately and minutely.

The people themselves are really the biggest thing at a state fair, and their dress their appearance, the atmosphere that surrounds the various individuals, from the barker at the lemonade stand to the high-toned aristocratic visitor from some large city, is quite likely to interest the farm boy. There are a great many different sorts of people, more than he even dreamed of before. It is well, therefore, to take a general view of the people and the exhibits and get an idea of the size of the fair; but after this is done it is well to settle down to some particular thing and make it the object of special study.

Naturally this will be, or at least should be, the things which are most closely identified with the farm. There are cattle on the farm at home. He thinks they are good ones, particularly if he happens to be the fortunate owner of a calf or a pig. He is apt to think they can't be beat; but if he will drift around to the judging pavilion and see the various herds of pure bred cattle of any particular breed, especially the breed they have on the farm at home, he will get a different conception of what a Shorthorn or Angus or Duroc Jersey or Poland-China or Tamworth or Shropshire or draft horse or roadster ought to be. Then if he will notice carefully the judging and see the process by which the judges eliminate first a large per cent of the exhibit and then individuals, until they finally select the one which in their judgment is best entitled to the award, it will help him to form an ideal of the perfect animal in his mind which he will retain for many years to come. If a man is to follow the life of a farmer, he must first get a picture in his own mind of what the stock ought to be, and the departure of the different individuals on the farm from this ideal or ideals; for the ideal bull is quite different from the ideal cow; the ideal beef animal quite different from the ideal dairy cow; the ideal draft horse quite different from the ideal roadster. If he can get these ideals firmly fixed in his mind it will pay him many times over for the time and expense of visiting the fair. The diversion, the knowledge of men and women, the different atmosphere which surrounds individuals, all these will be thrown in for profit.

We hope the boys and girls will as far as possible have an opportunity to see the fair, not as recreation alone or to have a good time, although there is plenty of recreation and plenty of good time thrown in for good measure, but to help qualify them for their life work. For this a well organized state fair, and to a less extent the county fair, affords abundant opportunity.

We don't mean by this that the boys should not have a good time or plenty of recreation. They ought to have; they deserve it; but they should learn the trick of getting an education with their good times and with their recreation, an education in the line of their future profession.

Many fond mothers imagine that there is some danger in allowing the boy or girl to go to the state fair. If there is any danger, the grounds for the danger existed before the boy ever say the light. The boy with good blood in him will not be in any danger of going wrong when he gets into a crowd of people. He will instinctively be attracted to the better sort and will instinctively avoid all that is evil and debasing. Let the boy come to the fair. Let him take his sister with him. They may not always be interested in the same thing, but there will be many things in which their interest will be mutual. Let them by all means as far as possible take in the fair. They will do better work at home and be better equipped for the business of life for having had this opportunity for recreation, amusement and instruction.

FAIR WEEK FOR A VACATION.

BY M. M. KNUDESON, STORY COUNTY, IOWA, IN THE HOMESTEAD.

There are some people in the world so sure they are not as other men that they even boast of never taking a vacation. Where good sense is displayed in such a performance is hard to discover, as they would not expect such a service of machine or beast of burden in their possession.

A misunderstanding regarding a bill for building material called together the office force of a large and thriving lumber company. The junior member of the firm was chief speaker, and was taking the lead in tracing up dates and statements. As he seemingly mused to himself over the day-book and ledger we noticed some of the things he said: "This I recorded myself, and this also. Now, John, how about that next date? You see that was when I was in Michigan. Give us the next item. Let's see, that was quite a while afterwards. December 1st; that was just after I left for California". Change in the office force had made some irregularities, but they were soon located in one or another of the books. Meanwhile the proprietor had unconsciously furnished the fact that he took vacations.

A most successful physician was "shadowed", and it was proved that he spent weeks at a time in Canada or at Seattle. The treasurer of one of our largest state institutions confessed to spending three weeks in summer in the woods of northern Minnesota, camping, hunting and fishing, with bank accounts and columns of figures far away.

On the state fair grounds, at one of the cottages, about the time the curfew whistle blew we were lingering with old friends and making new ones, loath to spend an extra moment in sleep when we were privileged to meet a venerable white-haired gentleman.

"No, I've not missed the state fair yet," he said. "I was one of the board that selected and purchased these grounds. Next Monday I start for Colorado to stay a while, but I could not miss the fair." He was a bright, well-preserved old gentleman, but a part of his plans had always been to take needed rest.

If a clear head and rested body are so necessary to distinguished people, might they not be a good investment to people in general? Every year we are having it impressed upon us more and more how much depends upon individual work. One can not do his best work when hands and head are ready to drop with weariness. Have it all planned. Leave your business. Go clear away and make it possible for everyone on your premises, at one time or another, to have a vacation. Having lived on a farm a greater share of the time all the years of my life, it has always been plain to me that farmers and their wives are prone to believe they must everlastingly "be in the harness" or everything will go to destruction. It surely is no compliment to one's management to confess one's affairs are in such condition that no one else can handle them. And you must be a hard master, indeed, if, after all these years, you have not at hand trusted help to take the lead while you choose to be absent a short time.

Better get rid of some of your eccentricities and leave the place long enough to learn that the cattle will lay on just as much flesh and the corn ripen just as fast as when you are at home. Don't look around to see only what there is to do; think of what you have accomplished and you will be convinced you have earned a vacation. Try going to the Iowa State Fair for a week, as a beginning, and you will find so many better ways for doing things you will have saved both time and money. What a weight it lifts from one's shoulders just to know how some one else is doing! You can get their knowledge at the fair, and not get too tired, either, if you set your mind to it.

By going a little ahead of time you will always secure good meals. Don't eat between times. Rest whenever you feel the need. There are settees in the shade all over the grounds. Of course there are people who attend the state fair and other such affairs and yet never see anything worth while. So there are people who are out on a bright spring day who never see the sunshine or hear a bird sing.

There is not too much pleasure in this world, so why not make the most of it? "All work and no play makes Jack a dull boy", and even worse, all work leaves Jack in such a condition that a stroll in green pastures beside still waters will not restore him. Every civilized man feels the need for a time of leisure and social intercourse. These necessities may, for a time, be held in check; but sooner or later, in a right way or a wrong way, they will assert themselves. Why not face the matter squarely, foreseeing the end and provide a balance? In other words, when we need a vacation is it not the wisest plan to take it?

SPECIAL ATTRACTIONS AT FAIRS.

BREEDERS' GAZETTE.

While it is admitted that the chief end of the fair, large or small, is educational, the financial end must by no means be overlooked. In other words a fair must pay or it must be discontinued, save in the instance of some exhibitions for which the tax-payers are responsible. The managers must therefore look out for the main chance and see to it that the balance is on the right side of the ledger. As a rule the fair managers have but one source of revenue to which they may look for success and that is the gate. If the people do not attend the receipts will not be large enough to cover expenses. To be sure there are fees of one sort and another, and the price of the various concessions, but in the end the money received from such sources goes but a short distance toward paying the bills, no matter how welcome it may be in a subsidiary sort of way.

The point then is to get the people to deposit their quarters or halves in the strong boxes at the gates. They must be attracted somehow or other. Various schemes have been tried in the hope of discovering the true magnet, managers having run the gamut from disgustingly obscene shows to the very best racing attractions, and in every instance it has been proved that the higher class the entertainment offered the greater the drawing power of the special attraction. Who does not remember the enormous crowds which gathered at the tracks in the Middle West when Joe Patchen and Star Pointer went their memorable series of races? At Springfield, Ill., nearly 60,000 people congregated to see the race and were rewarded by witnessing Star Pointer make a race record of 2:00½, which has never to this day been surpassed.

However, it is not always possible to obtain an attraction of such rare magnetic power as that was. Managers must as a rule content themselves with something of lesser magnitude. It is conceded that the racing end of a fair adds much to the revenue. The American people breed the trotter and pacer and like to see him go. Speculation does not enter into this discussion at all for the reason that at fairs such as are being dealt with there is no betting nor the desire for any. There is hardly a county in the whole country where some harness speed is not produced and the greater the degree of speed attained by the breeders the greater is the interest in the racing programme. We may therefore conclude that the racing division of a fair, large or small, has its legitimate place as benefiting a legitimate industry and as such is entitled to the support of the management and the populace. It has been demonstrated that the people would rather see a high-class racing performance than any other sort of a special attraction. Look at the enormous crowds Dan Patch has attracted. Prince Alert is another champion which has drawn golden harvests to many fairs. There would seem to be a pointer in this for most fair managers, especially now that horses are so high and so much in the consideration of the farmer. It is evident, however, that there are not champion trotters and pacers enough to go around and supply all the vast number of fairs annually held in the United States. In some communities the people take interest enough in the stock exhibited to attend in sufficient numbers to make the fair pay, but the instances where the spesial attraction is desirable are more numerous. What then is the manager to do? As a rule he will find his solution in something that pertains to the horse, something that is clean and legitimate, showing the speed or the intelligence of the animal and his ready assimilation of education. The "guideless wonder" was a grand success in its day. There is something of the sort new every year, and we all know that some good high jumping done on the track in front of the grand stand is always enjoyed by large and enthusiastic crowds.

It should be remembered though that a good equine show is not put on the road cheaply. It costs much money and therefore a fair price must be paid by the fair. Managers never will do any good by hiring cheap trashy shows as drawing cards no matter whether there are a dozen horses in them or one. Moreover, the man who puts such a combination on the road is entitled to know where he is going to land, and therefore dates should be taken early. Fair managers will find it to their advantage to make their arangements of this sort months in advance of the fair dates. In short if the public wants to see horses do stunts in a racing or educated way, by all means give it a good clean show of high-class and the dollars will be parted with readily time and again.

MORE INTEREST IN COUNTY FAIRS.

FARMER'S TRIBUNE.

World's fairs, state fairs and other large live stock shows are important institutions in advancing the live stock industry and farming in general. They have grown to such proportions in recent years that a person desiring to exhibit live stock must necessarily have considerable experience in order to compete successfully with men who have been in the show ring for years. This experience can not well be obtained except by actually bringing stock into the ring, by making a few mistakes at first and by profiting by these mistakes until the business has been learned. It is unnecessary at this time to advance arguments to prove that showing at the fairs is profitable to the exhibitor. The fact that our expositions are growing in size and in educational value from year to year is sufficient proof that breeders consider the money expended for exhibition purposes a good investment.

The breeder can advertise and keep his name before the public by means of printer's ink, which is all right and which is necessary, but there is nothing like becoming personally acquainted with one's customers. Aside from this, great live stock exhibitions arouse general interest in good stock. Thousands of men owe their start in pure-bred stock to the fact that at some fair they became convinced of the value of improved blood, when they saw the perfection to which it is possible to bring our domestic animals. To try to interest a man in an article concerning which he has no vivid conception is a difficult matter, but bring that article before his eyes, show it to him, talk with him about it and he is ordinarily easily convinced of its merits.

All can not attend our state, national and international shows, and this applies to both breeder and visitors. For this reason we have county fairs. Every man or some member of every family in every agricultural community can afford to attend one or more of our county fairs every year and this should by all means be done. School teachers have conventions and summer schools for the purpose of keeping in touch with advanced methods of teaching, and for the purpose of gaining enthusiasm from each other. A person who works by himself year after year and does not converse with others in his line of business or who does not study the methods of other people, is very apt to get into ruts. What school teachers do, professional and business men also do. They all meet with the purpose of securing each others' views on the subjects of interest to them with the hopes of profiting thereby. Farmers have their institutes where they meet and talk over with each other methods of farming a few days each year during the winter months. Many of these institutes have improved very much during recent years and are doing a great deal of good for the farming communities. But only a small per cent of the farmers attend them—a fact that is to be deplored. A much larger per cent is willing to attend fairs because they consider that there are more attractions at them, and to some extent there is.

There is no opportunity for the exhibition of live stock at farmers' institutes, or at least so far there has been none. The fair has been set aside for this purpose. It is, however, a common thing to hear remarks at county or even at state fairs by farmers something like these: "I have a better bull at home than that one", or I have a cow that has been running in the pasture all summer that looks a great deal better than any of those I see in the ring". Similar remarks are heard about sheep, horses, and for that matter everything one sees at a fair. The men who make these remarks should make it their business to bring their good stock along. So long as it left at home it can not be seen by the fair visitors, and that is what they come to the fair for—to learn something about live stock, good varieties of grain and a hundred other things of special interest to them.

Let the young men on the farm get some of their stock ready and bring it to their county fair. If you have a registered bull on the farm, by all means bring him along; if possible, bring some of his grade calves along and let the people see what that registered bull has done for you. If you can contribute something to the success of the fair, if you have some good stock, which experience has taught you is more profitable than poor stock, by all means bring it along. Remember that the fair can not be a success unless there are men willing to contribute to its success. A month or such a matter before the fair opens, feed one or two head of your best cattle a little grain, during the last week give them a little special attention in the way of currying to make them look nice; if possible give them a good bath the day before the fair. Use soap and water liberally, but be careful to get every particle of soap out of their hair. In this way you will make the animals look 50 per cent better. You may find upon reaching the fair that you have the poorest animal there, but what of it. It will teach you a lesson, and next year you will have a better one, perhaps it will be the means of your stock winning a first prize when you show again.

You will take a great deal more interest in the fair if you have something of your own on exhibition. You will study your neighbor's cattle more; you will be more anxious to learn from the successful exhibitor how he fed and bred his stock and how he prepared them for the show. Not only that, but you will learn to become a showman and in a few years when you have a herd of pure-bred cattle you will be wanting to attend the state fairs, and if you attend your county fair for a number of years you will receive preparation and training for showing at the state fairs that you can not receive in any other way.

THE COUNTY FAIR.

TWENTIETH CENTURY FARMER.

The fair season has now closed and the many benefits and advantages these local exhibitions have afforded their communities should not be lost sight of in the routine of farm and home duties. We cannot afford to overlook the importance of the county fair to the general agriculture and business interests of the county and state any more than to our individual interests. In every county where there is an effort being made to produce crops and grow live stock there is an urgent demand for the stimulating influences and educational advantages that accompany the well organized and properly conducted county fair.

The greatest incentive in county fair work is the cultivation of a friendly spirit of rivalry among the people in the county in what is being produced and owned on the farm and in the home. The county fair is what the people make it. To some the fair is only a matter of diversion, a few days of recreation and sight-seeing; to others it is an open book they read as they go from exhibit to exhibit. Each department opens up a new and interesting topic for study, consideration and discussion. The educational influence is great, even with those who seem to be but slightly interested; the casual observer is benefited, some new idea is brought before his mind or immature ones developed into practical thought.

The county fair is of greatest practical benefit to the exhibitor. When the farmer or stock grower enlists as an exhibitor at the county fair the seeds of improvement have been sown and the results will be found each year on the farm by improved grains, improved stock and improved machinery and a general spirit of advancement in all lines of agriculture.

The social feature of the county fair is an important consideration with the family and should not be lost sight of in taking up the advantages of fair organization. The boys and girls on the farm demand more recreation, amusement and social advantages than are usually afforded them. The three or four days' fair may be made quite helpful as a social feature to the families in the various neighborhoods. Who will deny that the remembrance of the old county fair back at the old home does not bring dreams of pleasure and visions of gladness to the hearts of the fathers and mothers of today? Then why not extend to our boys and girls more of the refining influence of social intercourse? The county fair may be made a great social event in any community. It is much easier to place the county fair upon a high educational, moral and social plane than to invite rowdyism, dissipation and obscenity within it gates.

A very important feature of advantage to be gained by the county fair organization is the representation it gets on the state board of agriculture. Most states make the county agricultural society an auxiliary to the state organization. In this there is great advantage, as the one is made to help the other, and the county society becomes a part in interest and action with the state association. If your county has not an agricultural society organized proceed at once to organize one. Call together a number of your best representative farmers and stockmen from various sections of the county and organize under direction of your state board of agriculture. Send to the secretary of the state board of agriculture for a form of constitution and bylaws and enlist at once in the encouragement of improved agriculture by giving annual exhibitions of what the farm produces.

The state fair needs the influence and support of the county agricultural society. It is not enough that they be organized with interests separate. Upon this union of interests of state and county depends in a great measure the agricultural advancement and general upbuilding of our agricultural interests in the state.

SOME BENEFITS OF EXHIBITING AT FAIRS.

E. H. MILLER, BEFORE WORTH COUNTY FARMERS' INSTITUTE.

The subject assigned me "Benefit of Exhibiting at Fairs" is one that I have always been interested in and I may also add I am a firm believer in. What are the objects of the fair? Is it not the gathering together of the people, more especially the farmers, for mutual improvement and instruction; the bringing together of the products of the farm, the workshop and the home for comparison? Nor is this the only object of the exhibitor in taking his products to the fair. Is not the chief object of the farmer engaged in any special branch of farming, such as raising some kind of thoroughbred live stock or some special kind of fruit, grain or vegetable impelled, to do so, not from the value of the premium award received if he is lucky enough to get one, but from the advertising he gets from bringing his products to the notice of the public at our fairs, which I claim and without the fear of successful contradiction, is the most prolific source of advertising known to the farming public. Not only is it a source of advertising for the farmer and his products, but a source of advertising all machinery and contrivances used by the farmer in producing his crops.

I visited the establishment of F. D. Humbert, of Nashua, Iowa, a breeder of national reputation of Chester White swine. In conversation with him I asked if his premiums paid him for his time, trouble and expense. He said when he first began exhibiting his stock it only paid for the advertising he got out of it. But since he had got his stock well up in the front rank his premiums paid him well for his trouble, he having obtained $830 in premiums at the Louisiana Purchase Exposition. It brings you as a breeder to the notice of the public and your stock to the notice of more men in one day than would perhaps see them in years on your farm. Men meet you that perhaps would never have known that you and your stock were in existence had you not exhibited them at the fair.

There is another benefit to be derived from the fair—that is the social and educational benefit. The farmer, who is isolated and confined to his farm day after day and perhaps week after week needs some relaxation from his toil—he needs a few days rest, and there is no place where he can spend his vacation more pleasantly and profitably than by planning his business so that he and his family can take the best the farm affords and all go to the fair. It furnishes an incentive for something better to the man with poor stock; for the man with good stock he wishes for the best—and the man with the best has to look to the improvement of his stock that the other fellow does not get in the lead.

A good county fair is the best means of advertising a county can have and in no other way can a county, state or nation advertise its resources as effectually and as cheaply as by putting them on exhibition at one of these fairs. The officers of our state think the county fair of sufficient importance that they appropriate a sum equal to 40 per cent of premiums paid up to $200 each year for the maintenance of a fair. With this generous donation from the state and with about the same amount given by our merchants, the farmers of this county should turn out and do their part to make our fair one of the best in the state. If your product is not sufficiently good to compete at national or state fairs begin at the county fairs and by persistent effort and improvement strive to reach the top.

A neighbor came to me last fall and asked if he had better exhibit his colt at the fair. I told him that if it was a good one he certainly had. He put him on exhibition and after the fair he told me he only got second premium of $1.00, but he said it paid him for he sold his colt for $50.00 which was $10.00 more than he had asked for him before the fair.

There were many exhibitors at our fair last fall who had never made an exhibit of their products at our fair before who went home well satisfied with the result of the exhibit.

In conclusion I would urge the farmers of this county to get interested in one of the best institutions that a county affords. Come out not only yourselves, but bring your wife and family if you have them. Bring some articles to exhibit, almost every farm has some animal or product that is worthy of exhibition. Come determined to make our fairs better than any of our neighboring fairs. If the farmers will bring the agricultural products the management will see to it that you have plenty of good, clean attractions and amusements. We can have a balloon ascension or horse race without the farmer, but an Agricultural fair must have the support of the farmers' exhibits.

If a farmer is perfectly contended with his lot, if he does not care to improve in his methods or improve the quality of his products, then the fair has no charms for him. But the fair is for the progressive farmer—the man who wants to farm by up to date methods; the man who is anxious for the best and most profitable kind of stock, grain and all farm products and for the best kind of machinery, for the economical production of the same. This kind of a man can get instruction and profit from a fair, and I leave yourselves to judge which kind of a farmer you are.

A SUCCESSFUL FAIR SEASON.

FROM TWENTIETH CENTURY FARMER.

Our readers have just passed through one of the most successful seasons of agricultural education ever experimented by even the oldest citizen. The fairs both large and small have been well patronized by exhibitors and visitors. The disposition to improvement has never been more pronounced in all lines of agricultural work. Each department of farm work has its adherents who carry on the campaign of education in the interest of the specialty or particular industry represented.

The agricultural fair of the present day may very properly be termed the modern agricultural object lesson school. It is through these lessons by comparison of objects, animals and things that the fair visitor becomes a student, a judge, a discriminator in quality between the various competitive exhibits. This training is involuntary: it creeps into the mind unobserved, and the first knowledge the person has that he is being educated is his asserting that "This is the Best," or "That is my choice," " I would not give this cow for half a dozen of the others," etc.

The intelligent man, woman, boy or girl who attends one of these well managed county, district or state fairs and comes away saying he or she is not greatly benefited does not express their honest sentiment. The agricultural fair of the present day is the greatest educator we have in practical farm production. No one appreciates this more than the agricultural newspaper man, who attends these shows from the beginning to the end of the fair season and observes the people and talks to them of the impressions formed. While everyone who attends the fair gains some advantage by the association or impressions made, the exhibitor comes more directly under the educational influence of the fair, and consequently reaps a greater benefit.

If you are not already associated with the county agricultural society take up the work at once. Help organize and prepare to hold a fair next year. The county association is the primary school for the training of our best exhibitors and fair men.

FAIRS FROM AN EDUCATIONAL STANDPOINT.

FARMERS' TRIBUNE.

When we enter into conversation with a person who has traveled extensively, we naturally feel like doffing our hat and give him respectful attention. Travel broadens the mind; it gives a person a knowledge of life that better fits him to take his place in the world. The benefits he receives are not due to his traveling from place to place, but to the things he sees and learns while traveling.

It is not possible for everyone to spare the necessary time or to go to the necessary expense to visit a very large portion of the country surrounding him. Hence, in order to bring to those who can not afford to travel and see the things they want to see, fairs and expositions have been inaugurated. By bringing the products of more than ordinary interest from large areas together at an exposition or a fair, a visitor can see more in a few days than he could possibly see in a full year of travel if obliged to travel about in order to reach them. Further, the fact that the products on exhibition are grouped enables the visitor to see them together and to make comparisons, and in that way a more definite idea can be secured than can be obtained under other circumstances. It is safe to say that the state fairs and expositions annually held throughout the great west are among the best educational features offered the public. The best proof that the people appreciate these institutions is seen in the wonderful attendance which they receive.

PART X.

FINANCIAL STATEMENT

AND

Report of Agricultural Conditions

BY

County and District Agricultural Societies in Iowa, 1905.

SECTIONS OF LAW GOVERNING COUNTY AND DISTRICT AGRICULTURAL SOCIETIES.

Sec. 1658. (Code Supplement.) County societies—Premiums. County and district agricultural societies may annually offer and award premiums for the improvement of stock, tillage, crops, implements, mechanical fabrics, articles of domestic industry, and such other articles and improvements as they may think proper, and so regulate the amount thereof and the different grades as to induce general competition.

(For annotations see code, page 605.)

Sec. 1659. (Code Supplement.) List of awards. Each county and district society shal annually publish a list of the awards, and an abstract of the treasurer's account, in one or more newspapers of the county, with a report of its proceedings during the year, and a synopsis of the awards. It shall also make a report of the condition of agriculture in the county to the board of directors of the state agricultural society, which shall be forwarded on or before the first day of November, in each year to the secretary of said society. The auditor of state, before issuing a warrant in favor of such societies for any amount, shall demand the certificate of the secretary of the state society that such report has been made. Any society failing to report on or before the first day of November shall not receive state aid for that year.

(For annotations see code, page 605.)

Sec. 1660. (Code) Appropriations from county. When a county agricultural society shall have procured in fee simple, free from incumbrance, land for fair grounds not less than ten acres in extent, or hold and occupy such amount of land by virtue of a lease, and own and have thereon buildings and improvements worth at least two thousand dollars, the board of supervisors of the county may appropriate and pay to it a sum not exceeding one hundred dollars for every thousand inhabitants in the county, to be expended by it in fitting up or purchasing such fair grounds, but for no other purpose; but the aggregate amount so appropriated shall not exceed one thousand dollars to any one society.

Section 1661—a (Code Supplement)—State aid to district or county—failure to report.

Any county or district agricultural society, upon filing with the auditor of state affidavits of its president secretary and treasurer showing what sum has actually been paid out during the current year for premiums, not including races, or money paid to secure games or other amusements, and that no gambling devices or other violations of law were permitted, together with a certificate from the secretary of the state society showing that it has reported according to law, shall be entitled to receive from the state treasury a sum equal to forty per cent, of the amount so paid in premiums, but in no case shall the amount paid to any society exceed the sum of two hundred dollars. When any society fails to report, according to law, on or before the first day of Novvember, that society shall not receive a warrant from the state auditor for that year, but the secretary of the state board of agriculture shall notify the county auditor of the county in which such society is located of such failure, and the board of supervisors may appoint a delegate to the annual meeting or state agricultural convention, said delegate to be a resident of said county.

(For annotations to original section, see code, page 605.)

Sec. 1662 (Code). Reports to supervisors. Each society receiving such appropriation shall, through its secretary, make to the board of supervisors a detailed statement, accompained with vouchers, showing the legal disbursement of all moneys so received.

Sec. 1663 (Code). Permits. The president of a district or county agricultural society may grant a written permit to such persons as he thinks proper, to sell fruit, provisions, and other articles not prohibited by law, under such regulations as the board of directors may prescribe.

Sec. 1664 (Code). Police power. The president of any such society may appoint such number of peace officers as may be necessary, and may arrest or cause to be arrested, any person violating any of the provisions of this chapter, and cause him to be taken before some justice of the peace to be dealt with as provided by law, and he may seize or cause to be seized all intoxicating liquors, wine or beer of any kind, with the vessels containing the same, and all tools or other implements used in any gambling, and remove or cause to be removed all shows, swings, booths, tents, carriages, vessels, boats, or any other thing that may obstruct or cause to be obstructed, by collecting persons around or otherwise any thoroughfare leading to the enclosure in which such agricultural fair is being held. Any person owning, occupying or using any of such things causing such obstruction, who shall refuse or fail to remove the same when ordered to do so by the president, shall be liable to a fine of not less than five nor more than one hundred dollars for every such offense. During the time the fair is being held, no ordinance or resolution of any city or town shall in any way impair the authority of the society, but it shall have sole and exclusive control and management thereof.

Sec. 1665. Fraudulent entries of horses. No person, partnership, company or corporation shall knowingly enter or cause to be entered any horse of any age or sex under an assumed name, or out of its proper class, to compete for any purse, prize, premium, stake or sweep-stake offered or given by any agricultural or other society, association, person or persons in the state or drive any such horse under an assumed name or out of its proper class, where such prize, purse, premium or sweepstake is to be decided by a contest of speed.

Sec. 1666. Penalty. Any person convicted of a violation of the preceding section shall be imprisoned in the penitentiary for a period of not more than three years, or in the county jail for not more than one year, and be fined in a sum not exceeding one thousand dollars.

Sec. 1667. Entry under changed name. The name of any horse, for the purpose of entry for competition in any contest of speed, shall not be changed after having once contested for a prize, purse,. premium, stake or sweepstake, except as provided by the code of printed rules of the society or association under which the contest is advertised to be conducted, unless the former name is given.

Sec. 1668. Class determined. The class to which a horse belongs for the purpose of an entry in any contest of speed, as provided by the printed rules of the society or association under which such contest is to be made, shall be determined by the public record of said horse in any such former contest.

REPORT OF AGRICULTURAL CONDITIONS BY COUNTIES.

ADAIR

J. S. CAVINESS, GREENFIELD, OCT. 5, 1905.

General Condition of Crops, etc.—The season has been one of general prosperity for the farming class. While the season, as a whole, was too wet and cold for the very best results, the county was free from devastating storms of hail, wind or cyclones, and the extremes were not such as to interfere materially with crop conditions.

Corn—Well matured and generally good in quality and quantity.

Oats—Not a large acreage, but yielded a fair crop and was of good quality. It was damaged to some extent in the shock by rains.

Wheat—Not much sown; fair yield.

Rye.—Very little sown, but yielded a fair crop.

Barley—Small acreage; yield and quality fair. Seems to do better for rotating on clover soils than oats.

Flax—None shown.

Buckwheat—Very little raised.

Millet—Not much sown.

Sorghum—Very little raised.

Timothy—A very good crop both in quality and yield. After growth never better.

Clover—Yield and quantity excellent. Too much rain for a good crop of seed.

Prairie Hay—Very good, but not a great deal raised.

Other Grains and Grasses.—Are growing luxuriously at this writing.

Potatoes—Early varieties good; late varieties fair.

Vegetables—Good crop.

Apples—Summer and fall varieties good; winter, fair.

Other Fruits.—Fair, except peaches and early plums.

Cattle—Reasonably plentiful and doing well.

Horses—Demand good and prices high.

Swine—Fair crop and are doing well.

Sheep—Neglected too much for the best interest of county.

Poultry—Generally doing well.

Bees—Not many kept, but did extremely well.

Drainage.—A great deal of tiling being done, and tile works cannot supply local demand.

Lands—Very little changing hands. Prices high.

Report of Fair.—Held at Greenfield, September 26, 27, 28. Weather ideal and attendance good. Large and excellent displays in all departments.

ADAMS

J. M. DEVORE, CORNING, OCTOBER 2, 1905.

Condition of Crops and Seasons.—The season has been favorable for all crops and no frost has visited this section up to date of making this report. Pastures have been the finest in years, and live stock is in excellent condition.

Corn—Will average about forty bushels per acre and is out of danger of frost; however, it was badly blown down by recent wind and rain.

Oats—Of good average quality, and yielded about forty bushels per acre.

Wheat—Quality excellent, and yielded about thirty bushels per acre.

Rye—Very little grown, but was of good quality and yield.

Barley.—Yielded about forty bushels per acre and was of good quality. Is mostly for early feed.

Flax—None grown.

Buckwheat—Not enough grown to make estimate.

Millet—Good, but very little grown.

Sorghum—Small acreage.

Timothy—Yielded about two tons per acre, and there was a large second growth.

Clover—Excellent crop, averaging about two and a half tons per acre, and with good second crop.

Prairie Hay—Very little in county, but was a fair crop.

Other Grains and Grasses—Spelt is considered a paying crop, and this year yielded about forty bushels per acre.

Potatoes—Early varieties were excellent, while the late were not so good. Damaged to some extent by late rains and warm weather.

Vegetables—An abundant crop and of good quality.

Apples—Yielded one-fourth crop and of poor quality, varities selling for one dollar per bushel.

Other Fruits—Cherries, small crop; peaches, none; grapes, average crop; raspberries, good; blackberries, good.

Cattle—Are in good condition. No disease reported. An excellent showing at our fair, Herefords leading, with Angus a close second.

Horses—Are in good condition and bring excellent prices. A great many raised in this county, proving more profitable than any other kind of stock.

Swine—A great many raised and are in a healthy condition; no cholera reported for the past three years. Owing to crossing of breeds by many farmers, we believe they have not been so profitable as they otherwise would have been.

Sheep—Are in a healthy condition and have been very profitable.

Poultry—Large numbers raised and are very profitable.

Bees—Have not been very profitable; a great many killed out last season; not many kept.

Drainage—A great deal of tiling has been laid the past five years and has been very profitable.

Lands—Very little changing hands. Prices range from $65 to $100 per acre.

Report of Fair—Held at Corning, Aug. 28th to 31st. It was a success in every respect, and the most pleasant one held in the history of the society.

ALLAMAKEE

A. C. LARSON, WAUKON, OCTOBER 10, 1905.

General Condition of Crops and Season—Good.
Corn—Extra good.
Oats—Good.
Wheat—Good.
Rye—Good.
Barley—Fair.
Flax—Fair.
Buckwheat—Good.
Millet—Good.
Sorghum—Extra good.
Timothy—Fair.
Clover—Good.
Other Grains and Grasses—Good.
Potatoes—Fair.
Vegetables—Fair.
Apples—Fair.
Cattle—Good.
Horses—Good.
Swine—Good.
Sheep—Good.
Poultry—Good.
Bees—Fair.
Drainage—Good.
Lands—Very few transfers being made.

Report of Fair—Held at Waukon, 12th, 13th, 14th and 15th of September. Prospects were the best for years, but rain spoiled our best day. Our people are interested in the fair, and another year, if the weather is favorable, we look for a record breaking exhibition.

AUDUBON.

C. E. BRENIMAN, OCTOBER 31, 1905.

General Condition of Crops and Season—The season has been an ideal one in many respects, and except for the wet cold spell in the middle of May and the disastrous wind storm of early August, it was a record breaker. As it was, the condition of the crops was above the average, small grain being of much better quality and above the average in quantity. The corn crop never matured better than the past season, and except for the down condition of that grain, will harvest a more mature crop than for many years.

Corn—In better cribbing condition than for many years, and unless an early snow, will harvest a greater average yield than for many years.

Oats—Are above the average in quality, and not below in quantity.

Wheat—Acreage smaller than usual, but crop much better in quality, and above the average of this county in quantity.

Rye—Only a small acreage, but of excellent quality and average quantity.

Barley—For the most part, of exceptional quality, and binned in most excellent condition.

Flax—None raised of any moment.

Buckwheat—None raised.

Millet—Matured early and of excellent quality, and immense yield.

Sorghum—Very little raised, but was matured well and worked up into the finest product of many years. The stalks were more than usually succulent.

Timothy—Of abundant quantity and average quality, except, possibly, of less nutrient quality than the average.

Clover—Was an immense crop, but like other grasses, too succulent to be a good keeper without excess of drying.

Prairie Hay—Very little in the country, but of excellent quality and above the average quantity per acre.

Potatoes—Early varieties were of excellent quality and above the average in yield per acre; about the usual acreage. Late varieties did not do so well, nor were they of average quality.

Vegetables—Almost all vegetables were above the average in quality and yield, and some surprising results were obtained in many varieties.

Apples—Apples were not abundant nor of good quality, the early varieties being moderately plentiful but knotted and wormy and altogether unsatisfactory. Of the late varieties, very few, cofparatively matured, and were not of very good quality.

Other Fruits—Small fruits, for the most part, were of excellent quality and average yield. Strawberries and raspberries were abundant and of excellent quality; grapes were scarce but of good quality.

Cattle—About the usual number of calves were raised, but not so many being fattened. Most of the farmers are doing no feeding, but the large feeders put, if anything, more cattle on the market than any year before in the history of the country.

Horses—About the usual number of colts were raised, and a large number of good horses shipped to other markets, while as many western horses were shipped in and sold to the farmers as were disposed of.

Swine—A large number of swine were marketed from this point the last season, and a large number raised. This is the center of the swine growing industry of Iowa, and the county has been especially free from cholera the past season.

Sheep—A large number of sheep have been shipped into this county the past season and but few shipped out. Farmers in general seem to be going into this industry.

Poultry—A great many chickens and ducks were raised and are now being marketed. Turkeys have been raised in larger quantities than for many years.

Bees—Bees did exceptionally well the past season, though some claim that the honey is not of as good quality as former years.

Drainage—This county is exceptionally well drained. Some small sloughs have been drained, but no other drainage is needed.

Othed Industries—A corn canning factory was established this year in Audubon, and although the season began late, owning to the first planting being almost a total loss, the output was above that looked for.

The ten creameries in the county did a much larger business than ever before, their output being many hundred pounds in excess of the average for many years, and of superior quality for the most part, commanding top prices on the market.

Lands—Prices have remained almost stationary the past year, although a few sales have been made at a slight advance over the top price of the year before.

Report of Fair—Held at Audubon, Sept. 5th, 6th, 7th and 8th. Owing to the weather being very unfavorable, the fair was continued until the 9th. The attendance was not large on account of the unfavorable weather. The live stock exhibit was very good, and other departments were about the same as in past years.

BENTON.

ARAD THOMPSON, VINTON, OCTOBER 17, 1905.

General Condition of Crops and Season—Good; not better in twenty years past.

Corn—One hundred per cent crop.

Oats—One hundred per cent crop.

Wheat—None raised, or if any, not enough to report.

Rye—About seventy-five per cent of an average crop.

Barley—Eighty-five per cent crop.

Flax—None raised.

Buckwheat—None raised.

Millet—Eighty per cent crop.

Sorghum—Sixty per cent crop.

Timothy—One hundred per cent crop.

Clover—One hundred per cent crop.

Prairie Hay—Very small acreage, but yielded well and was put in excellent condition.

Potatoes—Seventy-five per cent of average crop.

Vegetables—Ninety per cent crop.

Apples—Very small crop; not more than twenty-five per cent.

Cattle—Large number and of fine quality.

Horses—Have done well and command high prices.

Swine—Ninety percent of usual number raised.

Sheep—Usual number, and have done well.

Poultry—Seventy-five per cent of the usual number raised.

Bees—Honey crop was very light.

Drainage—The low lands are substantially tiled.

Other Industries—The industry of canning corn in this county is very extensively carried on, and, as a rule, profitable to both the farmer and packer.

Lands—Average price $100 per acre. Quite a number of farmers selling for a greater price.

Report of Fair—Held at Vinton, September 12th, 13th and 14th. The exhibition was a failure, owing to the unfavorable weather prevailing throughout the week.

BLACK HAWK.

B. L. MANWELL, LA PORTE CITY, OCTOBER 27, 1905.

General Condition of Crops, Etc.—The season has been generally favorable for most crops.

Corn—Above the average in yield, and of the best quality for years.

Oats—Good yield and weight, but generally colored.

Wheat—Very little raised, but yield and quality fair.

Rye—Small acreage, but yield a good average crop.

Barley—Very little raised.

Flax—None raised.

Buckwheat—Very little raised.

Millet—Not much sown this year, owing to very little corn being drowned out, on which land this cereal is usually sown.

Sorghum—None raised.

Timothy—Average crop, but first cutting was damaged to some extent by rains.

Clover—Average crop.

Prairie Hay—Very little raised.

Potatoes—Yielded about three-fourths of average crop.

Vegetables—Excellent, both in quality and yield.

Apples—Summer varieties yielded one-half the usual crop and were of very poor quality.

Other Fruits—Were good, both in quality and yield.

Cattle—A great many raised; are in good condition, and prices fair. The usual number being fed.

Horses—Are scarce and command high prices.

Swine—More than the average crop of pigs. None being marketed as yet.

Sheep—Very few raised or kept.

Poultry—Scarce, and prices high.

Bees—Did not do very well this season.

Drainage—A great deal of tiling being done.

Other Industries—Corn canning is one of the leading industries here. The canning company had fifteen hundred acres contracted this year and paid out nearly $30,000. The average crop of corn raised for this purpose pays the farmer more than $14 per acre. Nearly 3,000,000 cans were packed here this year.

Lands—Prices remain about the same as last year.

Report of Fair—Held at La Porte City, September 19, 20, 21 and 22. The best pleased crowd we ever had. The attendance was light, owing to the fact that Waterloo, (fifteen miles north), and Vinton (fifteen miles south) each held a carnival on the same dates.

The grade draft suckling colt class was pronounced the best ever seen, not excepting the State Fair. There were nineteen colts in this class, all of which were fine specimens; some of them looked as though they were full blood draft. All other departments of the fair were well filled with excellent exhibits.

BOONE.

F. M. LORENZEN, OGDEN, OCTOBER 23, 1905.

General Condition of Crops and Season.—Better than for several years. Crops are above the average, both in yield and quantity.

Corn.—A large acreage planted and will yield a good crop, averaging about forty bushels per acre. Favorable maturing weather has made quality good.

Oats.—Yield not so heavy. Will average about thirty bushels per acre. Rains during threshing season somewhat affected grade.

Wheat.—Acreage small, but quality good.

Rye.—None raised.

Barley.—None raised.

Flax.—None raised.

Buckwheat.—Very little sown.

Millet.—None raised.

Sorghum.—Good.

Timothy.—Light crop; below the average.

Clover.—Below the average, both in yield and quality.

Prairie Hay.—Good in both yield and quality.

Potatoes.—Fair acreage; yielded well and of good quality.

Vegetables.—Good.

Apples.—Poor.

Cattle.—County is well stocked with good cattle, which are in excellent condition.

Horses.—Are making noticeable improvement in breeding. Farms well stocked.

Swine.—The usual number to be marketed.

Sheep.—Very few raised.

Poultry.—A very profitable industry in this county.

Drainage.—Some tile being laid.

Other Industries.—Dairying is becoming more attractive to our farmers, and has been exceptionally profitable this year, owing to abundant pastures.

Lands.—Range in price from $75 to $110 per acre.

Report of Fair.—Held at Ogden. Owing to continued rain our fair was postponed from Sept. 6, 7, and 8 to Oct. 4, 5, and 6, and in point of exhibits, and, in fact, in every way, was a success, except as to attendance which was decidedly smaller than usual, but which fact can be attributed largely to the reason that the fair was postponed and was not generally known. And further, that our meeting was a victim of a combination of circumstances that worked to its detriment.

In the art hall the exhibits of the handiwork of the ladies was especially attractive.This department was well filled with novelties of home manufacture and much time was pleasantly spent by those interested in this class of work. There was a creditable showing of poultry, all coops in the department being filled with varieties of chickens, geese, turkeys, etc. Some very fine birds were shown.

Our hog exhibit was so large that we were obliged to build extra pens to accommodate all. Poland Chinas and Duroc Jerseys were the most prominent breeds on exhibit. Some sheep were exhibited. The exhibit of the cattle was exceptionally fine, as was the exhibit of horses and mules. Horse racing, baseball and foot ball games were among the attractions.

BUCHANAN.

A. L. NELSON, HAZLETON, NOVEMBER 24, 1905

The eleventh exhibition of the Hazleton District Fair Association was held at Hazleton, Sept. 19th and 20th, and was the most successful fair in the history of the association.

Small Grain.—Yielded well the past season, and was of very fine quality.

Corn.—Will yield an exceptionally large crop, and of excellent quality.

Pasturage.—Has been abundant, and all live stock is in good condition. There is a very notable improvement in the breeding of all kinds of live stock in this district.

Lands.—Range in price from $60 to $75 per acre.

BUENA VISTA.

C. E. CAMERON, ALTA, OCTOBER 12, 1905.

General Condition of Crops, Etc.—Good.

Corn.—Extra good quality, average acreage; will yield fifty bushels per acre.

Oats.—Fair quality, yielding forty bushels per acre.

Wheat.—Nothing but spring wheat raised here, which yielded twenty bushels per acre and was of good quality.

Rye.—Very little raised.

Barley.—Fair quality, and yielded an average of thirty bushels per acre.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Yielded three tons per acre and was of good quality.

Sorghum.—None raised.

Timothy.—Good quality, and yielded two and a half tons per acre

Clover.—Good crop of hay, yielding two tons to the acre; no seed.

Prairie Hay.—None here.

Potatoes.—Fair quality and yielded one hundred bushels to the acre

Vegetables.—All varieties good.

Apples.—Fall varieties were plentiful and quality good. No winter varieties raised here.

Other Fruits.—Plums yielded a fair crop.

Cattle.—Plenty, and generally healthy.

Horses.—Good horses are scarce on account of too many having been shipped.

Swine.—Are in very healthy condition, and the usual number were raised this year.

Sheep.—Very few raised.

Poultry.—A great deal of poultry is raised and farmers generally buy the best, as they are very progressive in this line.

Lands.—Range in price from $75 to $100 per acre.

Report of Fair.—Held at Alta, Aug. 22, 23, 24, 25, and was the most successful one in the history of the society, not only in point of attendance but in variety and excellence of exhibits in every department.

BUTLER.

L. J. ROGERS, ALLISON, OCTOBER 16, 1905.

General Condition of Crops and Season.—The weather was good while farmers were putting in the crop of small grain, but from May first until July first we had a good many heavy rains making it hard to tend corn, which was very late. Had fair weather in which to harvest tame hay.

Corn.—The crop will be above the average in yield, and is of good quality.

Oats.—The yield is not quite an average one, and quality only fair.

Wheat.—None raised.

Rye.—Acreage small; yield good.

Barley.—Quality and yield good, acreage small.

Flax.—Very little raised.

Buckwheat.—Yield good.

Millet.—Very little sown.

Sorghum.—None raised.

Timothy.—Acreage large and yield heavy. Good weather for harvest after the first week.

Clover.—Yield good; many getting a heavy second crop.

Prairie Hay.—Acreage small, but yield good.

Potatoes.—Light crop.

Vegetables.—Late, but very good.

Apples.—Not a good crop.

Other Fruits.—Grapes did very well; berries of all kinds were plentiful and cheap; fair crop of cherries; no plums.

Cattle.—Have about the usual number this fall. A good many farmers are buying stockers and feeders at Omaha and other markets. Indications are that there will not be as many fed for market as last year.

Horses.—Prices have been very high during the summer and fall, and good ones have been sold off closely. However, the county is full of colts, and very good ones, too, many two-year-olds having been sold for $100. The farmers prefer to raise the heavy kind, although there has always been a good many trotting and pacing horses raised.

Swine.—The crop of pigs is not large this year. Prices have been good, and the old hogs are well shipped out. No disease reported.

Poultry.—Has done well and farmers are paying more attention to this industry. Eggs have brought a good price, as have also the fowls.

Bees.—Have done well and honey is selling at from eight to ten cents per pound.

Drainage.—The farmers have put in more tile this year than in any two years previous; this, together with road working, has helped the drainage very much.

Other Industries.—Not many factories at present; some manufacturing of cement blocks and bricks. Dairying is the leading industry and this year has been very profitable, as the pastures have been good and prices fair.

Lands.—Have not changed in price much this year. Good farms are selling at from $60 to $85 per acre. Not so many going away to buy cheap lands as during the last two years.

Report of Fair.—Held at Allison, Aug. 23, 24, 25. Wednesday, Aug. 23, was entry day. The weather was favorable and the entry list was very large in all classes except in fruit and farm products. We had the heaviest rain of the season on Wednesday night and Thursday morning until ten o'clock and in consequence the fair was postponed one day. Friday, our second day, was a record breaker in attendance. The weather could not have been more favorable than it was on Friday and Saturday. Saturday's attendance was about as usual for the last day. Fair racing each day; ball games two days; balloon ascension Friday and Saturday, which proved a drawing attraction. Our premiums amounted to $726.00, which is about $200.00 more than we usually pay, and shows that the farmers are taking more interest in the fair and are willing to bring their stock to show. For the first time we offered premiums on the best townhip display of farm wagons decorated with farm products. Three wagons were entered which were very fine, and we expect to have many more entries next year. Premiums amounting to $45 were paid for this exhibit. Our account will show a balance of about $200 this year; we think we are very fortunate and hope every society in the state holding a fair this year will do as well.

CASS.

C. S. BROWN, ATLANTIC, OCTOBER 27, 1905.

General Condition of Crops and Season.—Very good; rather above the average.

Corn.—Good; better than average crop. Blown down badly in some parts.

Oats.—Better than average both in yield and quality.

Wheat.—Acreage small, but yield and quality good.

Rye.—Acreage small, but yield and quality good.

Barley.—Small acreage, yield and quality fair.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Small acreage, but produced a good crop.

Sorghum.—Very little raised.

Prairie Hay.—None raised.

Other Grains and Grasses.—Pastures excellent.

Potatoes.—Poor crop, owing to wet season.

Vegetables.—Abundant and quality good.

Apples.—Yield small and of poor quality.

Other Fruits.—Yielded an abundant crop and were of good quality.

Cattle.—About the usual number in the county. Noted improvement in grade. Calf crop about ninety per cent.

Horses.—Same as cattle, except per cent of increase, which is about sixty per cent.

Swine.—Usual number, average per cent of increase.

Sheep.—This industry is on the increase.

Poultry.—Receiving a great deal of attention and the industry is rapidly increasing.

Bees.—Very little attention given this industry.

Drainage.—Good natural drainage and very little need of artificial.

Other Industries.—Manufacturing is on the increase.

Lands.—Values advancing; prices ranging from $50 to $110 per acre

Report of Fair.—Held at Atlantic, Sept. 25, 26, 27 and 28. A very successful meeting, both from point of attendance and variety and excellence of exhibits.

CASS.

D. P. HOGAN, MASSENA, OCTOBER 14, 1905.

General Condition of Crops and Season.—Good.

Corn.—Fair to good.

Oats.—Good.

Wheat.—Good.

Rye.—Good.

Barley.—Good.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—None raised.

Sorghum.—None raised.

Timothy.—Very good.

Clover.—Very good.

Prairie Hay.—None raised.

Other Grains and Grasses.—Good.

Potatoes.—Fair.

Vegetables.—Good.

Apples.—Poor.

Other Fruits.—Generally good.

Cattle.—Condition very good.

Horses.—Good condition.

Swine.—Condition good. There has been some cholera but none reported at present.

Sheep.—Good condition.

Poultry.—Good condition.

Bees.—Good.

Drainage.—Considerable tile being put in.

Lands.—Advancing in value, prices ranging from $50 to $100 per acre.

Report of Fair.—Held at Massena, Sept. 18 to 22. Was extended one day on account of rain on Monday, the 18th. The exhibition was an unqualified success from every standpoint, the attendance being good and the showing of stock and products excellent. Everyone was well pleased, and we have great encouragement for another year.

CALHOUN.

T. GRIFFIN, MANSON, SEPTEMBER 16, 1905.

General Condition of Crops and Season.—The weather has been more favorable than for several years, consequently all crops are good.

Corn.—Acreage large and will yield a heavy crop and of good quality.

Oats.—Of fair quality and yielded on an average of fifty bushels per acre.

Wheat.—Very little sown.

Rye.—Not much raised.

Barley.—Good.

Flax.—None raised.

Buckwheat.—Poor.

Millet.—Good.

Sorghum.—Good.

Timothy.—An exceptionally large crop.

Clover.—A large crop and of good quality.

Prairie Hay.—Very good.

Potatoes.—Poor.

Vegetables.—Fair.

Apples.—An excellent crop, both in quality and yield.

Other Fruits.—Were abundant and of good quality.

Cattle.—The exhibition in this department at our fair was large, several fine herds being shown and all by owners in this immediate vicinity.

Horses.—This department at our fair was large and excellent.

Swine.—Are in good condition.

Sheep.—Very few raised.

Poultry.—Are raised extensively and have brought good prices the past season.

Bees.—Did exceptionally well.

Drainage.—Not very good.

Other Industries.—Creameries and canning factories are doing a profitable business.

Lands.—Prices range from $75 to $100 per acre.

Report of Fair.—Held at Manson, September 5, 6, 7 and 8. A light rain fell the first day of the fair, but the last three were very satisfactory. The association spent over one thousand dollars this year in erecting new buildings on their grounds. The stock exhibit was the largest and best ever seen in this part of the state.

CHICKASAW.

J. A. YARGER, NASHUA, OCTOBER 25, 1905.

General Condition of Crops and Season.—Good.

Corn.—The crop is the best for ten years.

Oats.—A very good crop. Not as large a yield as some other years but of first class quality.

Wheat.—Very little raised in this locality.

Rye.—Yield below average of former years; winter killed to some extent.

Barley.—Good both in quality and yield.

Flax.—Very little raised.

Buckwheat.—Good both in yield and quality.

Sorghum.—None raised.

Timothy.—First class.

Clover.—Good, with the exception of a few pieces damaged by freezing last winter.

Prairie Hay.—None raised.

Other Grains and Grasses.—Good.

Potatoes.—About half a crop.

Vegetables.—First class.

Apples.—Large crop of early varieties.

Other Fruits.—All small fruit was good.

Cattle.—Were never in better condition.

Horses.—Plentiful and of good quality.

Swine.—Are in good condition.

Sheep.—Are of good quality, but are not kept extensively.

Poultry.—A great many raised, and are free from disease.

Bees.—Very few in this county.

Drainage.—As yet has not received the attention of the farmers.

Lands.—Of good quality and prices range from $50 to $90 per acre.

Report of Fair.—Held at Nashua, September 5, 6 and 7. Our fair is improving every year, and we expect to further improve the exhibition of 1906.

CLAYTON.

HENRY LUEHSEN, GARNAVILLO, SEPTEMBER 20, 1905.

General Condition of Crops, Etc.—The season was exceptionally favorable, and all crops are the best raised for many years.

Corn.—Of good quality and will yield above the average of former years.

Oats.—Acreage very large and yield and quality good.

Wheat.—Small acreage, but both spring and winter varieties yielded well and was of good quality.

Rye.—Very little raised.

Barley.—Acreage not quite up to the average, but yielded a good crop.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Very little raised.

Sorghum.—Good average yield.

Timothy.—Good crop both in seed and hay.

Prairie Hay.—Good average crop.

Other Grains and Grasses.—Are fully up to the average.

Potatoes.—About one-half crop, and quality not very good.

Vegetables.—Very good.

Apples.—Not up to the average, either in yield or quality.

Other Fruits.—Were abundant and of good quality.

Cattle.—Our farmers are raising cattle extensively. Many of them have choice thoroughbred stock, some selling as high as $700 a head, such as Shorthorns, Herefords, Polled Angus, Galloways and Jerseys.

Horses.—Good prices prevail, and there is a noticeable increase in the number being raised.

Swine.—This industry is growing yearly. Some of the principal breeds are Poland Chinas, Berkshires, Chester Whites, Duroc Jerseys and Yorkshire.

Sheep.—Are being raised extensively. Some farmers have large flocks.

Poultry.—In a flourishing condition and is very profitable.

Bees.—Did well.

Drainage.—Good natural drainage.

Other Industries.—Creamery industry is the principal one.

Lands.—Of rich black soil in most sections. Some rough land.

Report of Fair.—The 45th annual exhibit of the Clayton County Agricultural Society was held at National, September 5, 6, 7 and 8. The attendance was the largest in the history of the association. Exhibits were good in every department, especially in live stock. The weather was favorable throughout the week and the exhibition was a success in every respect. The races were interesting, as were also all other attractions, and all who were in attendance were well pleased. No gambling or immoral shows were allowed on the grounds.

CLAYTON.

J. A. KRAMER, ELKADER, OCTOBER 28, 1905.

General Condition of Crops and Season.—Good.

Corn.—Good, both in quality and yield.

Oats.—Yielded a fair crop in some localities, in others not so good; damaged to some extent by discoloring.

Wheat.—Small acreage but yielded well and was of good quality.

Rye.—Average crop both in quality and yield.

Barley.—Yield good; quality fair.

Flax.—None raised.

Buckwheat.—Small acreage but yield and quality fair.

Millet.—None raised.

Sorghum.—Good.

Timothy.—Good yield: was damaged to some extent by rains at haying time.

Clover.—An excellent crop, both in hay and seed.

Prairie Hay.—None raised.

Potatoes.—Yielded a small crop and are of poor quality.

Vegetables.—All varieties excellent.

Apples.—Poor crop, both in quality and yield.

Other Fruits.—Were abundant.

Cattle.—This locality is well stocked and cattle are in good condition.

Horses.—The average number raised and are in good condition.

Swine.—About the usual number of young pigs, which are in a healthy condition.

Sheep.—Industry is growing.

Poultry.—Quite plentiful and of the better breeds.

Bees.—This industry is also on the increase and they did well the past season.

Drainage.—Natural.

Lands.—Few sales, but prices are high, from $35 to $100 per acre.

Report of Fair.—Held at Elkader, August 22d to 25th, and was pronounced one of the best, if not the best fair ever held in northeastern Iowa. The exhibits were first class in every department, and the attendance was good, considering the unfavorable weather. It rained all of Thursday morning, clearing up at noon, otherwise we would have had a record breaking crowd.

CLINTON.

PHIL BUTTERFUS, DE WITT, OCTOBER 28, 1905.

General Condition of Crops and Season.—A late June, and forepart of July was very wet, but the fall has been very favorable and the general condition of crops and prices were never better.

Corn.—Will yield a large crop of A. 1 grade.

Oats.—The best crop ever raised in this county, both in yield and quality.

Wheat.—Very little raised.

Rye.—Small acreage, but yielded well.

Barley.—Small yield, but was of good quality.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Small acreage but yield and quality good.

Sorghum.—Very little raised.

Timothy.—Very good crop, both in quality and yield.

Clover.—Very good in some localities, while in others was winter killed to some extent.

Prairie Hay.—Very small acreage in this county, but yielded a good

Potatoes.—Small yield, but of good quality.

crop which was put up in excellent condition.

Vegetables.—Yield and quality good.

Apples.—Small yield and of poor quality.

Other Fruits.—Were good, excepting cherries and plums.

Cattle.—Are doing well and prices are good. A large number of western cattle have been brought in.

Horses.—Doing well and prices are high.

Swine.—Are in good condition. The display at our fair was the largest in its history, there being three hundred and twenty-five head on exhibition.

Poultry.—Raised extensively and command good prices.

Bees.—Very few kept.

Drainage.—Low lands are well tiled and it has proven profitable.

Lands.—Very little changing hands. Prices range from $75 to $100 per acre.

Report of Fair.—Held at De Witt, September 12th to 15th; cloudy weather the first two days. Best attendance in the history of the association. All departments well represented and the display of hogs was never better. Many of the best hog breeders come to the fair to purchase and sell their stock. It was necessary to build forty new pens to accommodate all exhibitors.

CLINTON.

J. B. AHRENS, LYONS, OCT. 14, 1905

General Condition of Crops and Season.—Very good. The season has been more advanced than last year by nearly twenty days; having had no frost up to October 11th; ground very dry.

Corn.—The prospect for yield of corn is the best we have had for several years.

Oats.—Yield medium; color good.

Wheat.—Very small acreage in this section, but yielded well.

Rye.—Very poor yield. In some sections hardly paid to be threshed.

Barley.—A good yield but of poor quality.

Flax.—None raised.

Buckwheat.—Small acreage but yielded well.

Millet.—Small acreage, yield fair.

Sorghum.—Very little raised.

Timothy.—Light yield but of good quality.

Clover.—Excellent, both in hay and seed. Seed threshed on an average of three bushels per acre and is selling at $6.00 per bushel.

Prairie Hay.—None raised.

Potatoes.—Early varieties fair, while late were both poor in quality and yield.

Vegetables.—Good.

Apples.—Yield not very heavy but of good quality.

Other Fruits.—Were plentiful.

Cattle.—Quality fair; more are being fed for beef than last year.

Horses.—Principally draft horses being raised, for which there is a ready sale at good prices.

Swine.—Supply not so large as last year; quality good; old hogs nearly all sold.

Sheep.—Very few kept or raised.

Poultry.—Large numbers raised and are bringing good prices; turkeys scarce.

Bees.—Not as plentiful as last year.

Drainage.—About the usual amount of tile being laid.

Lands.—Prices range from $80 to $125 per acre; general average around $90 per acre.

Report of Fair.—Held at Clinton, Sept. 19-22. The weather was ideal throughout the week. The attendance was larger than ever before and the exhibition a success in every particular. The live stock exhibit, and, in fact, the exhibits in all departments, were larger than any former exhibit two years combined. We had to build additional pens in the swine department to accommodate this exhibit.

DAVIS.

J. C. BROUHARD, BLOOMFIELD, OCT. 21, 1905

General Condition of Crops, Etc.—The season has been very unfavorable, owing to excessive rainfall. On June 9th we had an exceptionally hard rain, which destroyed most of the crops on bottom lands, and continued rains prevented cultivation of corn for three weeks.

Corn.—Will yield below the average of former years, but is of fair quality.

Oats.—Large acreage; yield light; quality fair.

Wheat.—Small acreage, but yielded well and was of good quality.

Rye.—Small acreage, but yield and quality fair.

Barley.—None raised.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Small acreage, but yielded a fair crop of both hay and seed.

Sorghum.—Small acreage, but yield and quality good.

Timothy.—Yielded a good crop of hay but a very light crop of seed.

Clover.—Yield and quality of hay good, with prospect for fair crop of seed.

Prairie Hay.—None grown.

Potatoes.—Not extensively raised, but enough for home consumption. Yielded a fair crop and were of good quality.

Vegetables.—Good.

Apples.—Summer varieties yielded a small crop, while winter varieties were almost a total failure.

Other Fruits.—Small fruits of all kinds yielded a large and excellent crop. Plums did well; peaches a failure.

Cattle.—There is a noticeable improvement in the grade of cattle being raised, breeders using nothing but pure bred sires. Pastures were never better and cattle are in good condition.

Horses.—One of the leading industries of this county, and a great many are shipped to eastern markets.

Swine.—Doing well and have been free from disease the past season.

Sheep.—One of the most profitable industries we have and have done well the past season where properly cared for.

Poultry.—Industry is increasing.

Bees.—Wintered fairly well but did not store an average crop of honey, owing to cool and rainy weather while white clover was in bloom.

Drainage.—Natural drainage is very good, and but little tiling is being done.

Lands.—Very little changing hands; prices high.

Report of Fair.—Held at Bloomfield, Sept. 12-16. The original dates set for holding our fair were Sept. 12 to 15, but owing to it raining all day on Wednesday, the 13th, we were compelled to extend the fair over Saturday, Sept. 16th. The weather on the whole was unfavorable throughout the week, and the track was in such condition that it was impossible to make fast time in the races. The exhibits in most of the departments were as large as usual and very good in quality. The amount paid in premiums was equal to former years and the exhibition was a success in every respect except financially.

DELAWARE.

C. J. PENTONY, MANCHESTER, SEPT. 20, 1905

Oats.—Of good quality and yielded from 30 to 60 bushels per acre

Rye.—Good.

General Condition of Crops and Season.—Good.

Corn.—Best in years.

Report of Fair.—Held at Manchester, Sept. 5-8. The general opinion is that it was the best exhibition ever held here.

Barley.—Excellent.

Millet.—Average crop.

Sorghum.—Small acreage but yielded a good crop.

Timothy.—Good.

Clover.—Good.

Potatoes.—A small crop of fair quality.

Vegetables.—Fair.

Apples.—Poor.

Other Fruits.—Very good.

Cattle.—Are in fine condition.

Horses.—Are in good condition.

Swine.—In good condition.

Sheep.—Have done well.

Poultry.—Has done well.

Bees.—Have done well.

Drainage.—Good.

Lands.—Steadily increasing in price.

FAYETTE.

H. P. HANCOCK, WEST UNION, OCT. 21, 1905.

General Condition of Crops, Etc.—Good. Plenty of rain and all crops matured well, no killing frost until the middle of October; something unusual for this section.

Corn.—Large acreage; yield and quality the best in years.

Oats.—Yielded an abundant crop and was of good quality. Very little rust.

Wheat.—Small acreage; quality and yield good.

Rye.—Acreage small, but yielded well and was of good quality.

Barley.—Yield and quality good.

Flax.—Very little raised.

Buckwheat.—Small acreage.

Millet.—Very little grown.

Sorghum.—Small acreage but yielded a good crop.

Timothy.—An exceptionally large yield, and was of good quality.

Clover.—Small per cent winter killed, but usually yieded a fair crop.

Prairie Hay.—Small acreage but of fine quality.

Potatoes.—Usual acreage planted but yielded a small crop and of poor quality, rotting to some extent on account of frequent rains.

Vegetables.—A large and most excellent crop.

Apples.—Yielded fairly well and of fine quality, but many orchards are dying yet.

Other fruits.—Small varieties were most excellent in quality and abundant in yield. Plums and grapes yielded a fair crop.

Cattle.—Are extensively raised and are in excellent condition. Many fine head of pure-breeds in this county.

Horses.—Roadsters and all draft breeds are raised. There is a ready sale at good prices.

Swine.—Large numbers raised. Prices good. No diseases reported.

Sheep.—Very few raised. Prices are good. No disease reported.

Poultry. An industry all farmers engage in and is a source of much profit.

Bees.—Quite a number kept in this county and produce an excellent quality of honey.

Drainage.—Very little tiling being done, as the natural drainage is excellent.

Other Industries.—Canning of sweet corn is quite an extensive one, there being over one and a half million cans packed here the last season. Manufacturing of tile and brick is engaged in quite extensively.

Lands.—Very little changing hands; prices range from $50 to $100 per acre, depending upon improvements, etc.

Report of Fair.—Held at West Union, Sept. 5-8. This was the fifty-first annual exhibition held by our society and it was one of the most successful in its history, both in attendance, quality and extent of exhibits and net receipts. The attractions were good and the interest was centered on Old Soldiers' and Governor's Day, when an address was made by Governor Cummins and Ex-Governor Larrabee.

FLOYD.

C. M. CARR, CHARLES CITY, OCT. 24, 1905.

General Condition of Crops and Season.—Good, except potatoes, which were struck with blight and caused almost a failure of this crop.

Corn.—On uplands is generally good, and is fully matured at this writing.

Oats.—Yielded well, but on account of wet weather were of poor quality.

Wheat.—None raised.

Rye.—Small yield and poor quality.

Barley.—Good.

Flax.—Very little raised.

Buckwheat.—Blighted and a total failure.

Millet.—Very little sown.

Sorghum.—Small acreage but of good quality.

Timothy.—Good.

Clover.—Good.

Prairie Hay.—Small acreage but yielded well and was put up in excellent condition.

Potatoes.—Poor.

Vegetables.—Good.

Apples.—Fair.

Other Fruits.—Good.

Cattle.—Usual number raised and are in good condition.

Horses.—Good marketable classes are raised, for which there is a ready sale at good prices.

Swine.—Are generally in a healthy condition, except in the west part of the county, where cholera is quite prevalent.

Sheep.—Not many kept or raised, but are in good condition.

Poultry.—Raised extensively and is the source of much revenue to the farmer.

Bees.—Are quite generally kept, but the season being too wet has caused the honey product to be very small.

Drainage.—A great deal of tiling is being laid.

Other Industries.—Are gasoline engine works, planing mills, sash and door factory, furniture, several large wagon factories and a disc and harrow factory.

Land.—Quite a few transfers have been made at good prices.

Report of Fair.—Held at Charles City, Sept. 12-15.

FRANKLIN.

J. W. CUMMINGS, HAMPTON, OCT. 16, 1905.

General Condition of Crops and Season.—Good.

Corn.—Well matured and of excellent quality.

Oats.—Yielded well. Quality good, except those threshed from the shock, which were discolored to some extent.

Wheat.—Fair.

Barley.—Fair.

Buckwheat.—Poor.

Sorghum.—Good.

Timothy.—A very good crop of seed.

Clover.—Light crop.

Prairie Hay.—Good.

Potatoes.—Early varieties good, late varieties fair.

Vegetables.—Excellent.

Apples.—Small yield and of fair quality.

Cattle.—The usual number raised and are in good condition. Also about the usual number of feeders.

Horses.—A great many colts raised the past season.

Swine.—The usual number raised and no disease reported.

Sheep.—Very few kept or raised.

Poultry.—Large numbers raised.

Bees.—Good.

Drainage.—More tiling being done this year than usual.

Lands.—Very little changing hands, prices remain the same as last year.

Report of Fair.—Held at Hampton Sept. 12-15. Exhibits were large in every department and the exhibition was a success in every respect, excepting financially, heavy rains preventing the attendance which we would otherwise have had.

GRUNDY.

E. G. ENSMINGER, GRUNDY CENTER, OCT. 5, 1905.

General Condition of Crops, Etc.—The early part of the season was wet and cold and unfavorable for crops, especially corn, which extended up to about the fifteenth of June. Unusually favorable conditions thereafter has made the season all that could be wished for, as there have been no killing frosts up to date of making this report.

Corn.—Indications are that it will yield an abundant crop of good quality.

Oats.—Yielded from 35 to 50 bushels per acre and were of good quality.

Wheat.—Small acreage.

Rye.—None raised.

Barley.—Average crop; quality good.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Small acreage but yielded well and was of good quality.

Sorghum.—None raised.

Timothy.—Yielded an excellent crop of both hay and seed.

Clover.—Good. First crop heavy and second growth very good, making the hay crop this year above the average.

Prairie Hay.—None raised.

Potatoes.—Larger acreage than usual planted, which yielded well and was generally of good quality.

Vegetables.—Good both in quality and yield.

Apples.—Duchess and Wealthy are the prevailing varieties raised, which produced only a fair crop this season.

Other Fruits.—Season too wet for perfect maturing of small fruits.

Cattle.—An increased interest is being taken in the breeding of live stock. Several fine herds of Shorthorns are owned in this county.

Horses.—Some very fine imported horses have been brought in during the last year, and there is a tendency among the farmers in this county to improve the grade of their horses. Several cars of fine animals are shipped from this district to eastern markets each year.

Swine.—One of the leading branches of the live stock industry, and farmers in this vicinity find it profitable to pay especial attention to the breeding of a high grade animal.

Sheep.—There is a noticeable increase in interest taken in this branch of stock raising. There are some fine flocks in this county.

Poultry.—This industry is becoming quite extensive and is proving to be one of the most profitable branches of farming.

Bees.—Very few raised or kept.

Drainage.—Natural drainage is very good, as there are a good many creeks running through the county. However, there has been some tile laid during the past few years, and all sloughs are well drained.

Other Industries.—Are creameries, brick and tile factories, flour mill; all of which seem to be doing a flourishing business.

Lands.—Is a deep black loam soil with clay subsoil, and is well adapted to all kinds of seasons. Prices range from $75 to $125 per acre.

Report of Fair.—Held at Grundy Center, Sept. 12-14. Very favorable weather prevailed on Tuesday, the opening day of the fair, and all departments were well filled with excellent exhibits. There was an increased effort on the part of our people to make the 1905 fair a success and the patrons were not disappointed. Wednesday, the second day, was a record breaker, notwithstanding the threatening weather in the morning. Heavy rain on Thursday morning kept the people from coming early, but in the afternoon the attendance was up to the average of former years.

As a special attraction we had Troop H of the Eleventh U. S. Cavalry, and they proved a drawing card.

The live stock exhibits were the best and largest in the history of the society, and the horse and swine departments were filled to overflowing, and new pens and stalls had to be built to accommodate the exhibit.

The total receipts were very satisfactory, being far beyond our expectations. Four hundred and twenty-five dollars was spent for permanent improvements, and after paying all expenses, attractions, races and premiums we find ourselves with a balance large enough to pay off a debt of $580 which has stood against the grounds for several years, and it is very encouraging to find ourselves free from debt in planning our 1906 fair.

GUTHRIE.

ALEX H. GAISELL, GUTHRIE CENTER, OCT. 24, 1905.

General Condition of Crops and Season.—The season was favorable for the growing of crops.—Seasonable rains fell when needed, producing luxuriant pasturage and a wonderful crop of hay. Corn on the uplands and drained bottoms is an average crop. Poor seed planted reduced the crop in many fields. Oats did not reach the expectations warranted by the season and the growth of straw, the yield being from twenty-five to forty bushels per acre.

Report of Fair.—Held at Guthrie Center, Sept. 12-15, and the week was one not soon forgotten by the managers of the association. Tuesday it rained and continued until Thursday. Friday the clouds rolled away but the roads and the grounds were a sea of mud. This was the only day that any money was taken in at the gates. Thursday night it again rained and the fair of 1905 was all off. If the weather had been good the attendance would have been a record breaker.

HANCOCK.

W. A. SIMKINS, BRITT, OCT. 3, 1905.

General Condition of Crops and Season.—Has been exceedingly good and except that excessive rains in the early part of the season shortened the crop some in low places.

Corn.—Good acreage and well matured.

Oats.—Large acreage and fair quality.

Wheat.—Very little raised, quality and yield good.

Rye.—Very little sown.

Barley.—Light acreage; quality fair.

Flax.—Scarcely any sown.

Buckwheat.—Acreage light; quality good.

Millet.—Light acreage; quality good and heavy.

Sorghum.—Light crop.

Timothy.—Increased acreage; quality heavy; a good crop harvested in good shape.

Clover.—Same as above.

Prairie Hay.—Quality heavy and good. Acreage increasing.

Potatoes.—Early crop heavy and of good quality; late crop light.

Vegetables.—Crop heavy and quality good.

Apples.—Crop good and quality fine. More than enough raised to supply home demand, and a great many were shipped out.

Other Fruits.—The berry crop was good, while all other fruits yielded light and were of fair quality.

Cattle.—There is a noticeable increase in the number being raised, and more attention is being given to breeding of fine stock.

Horses.—A great many are raised and are in good condition.

Swine.—A great many raised and are free from disease.

Sheep.—Very few raised or kept.

Bees.—This industry is increasing and the honey crop last season was large and of excellent quality.

Drainage.—Great deal of ditching and tiling has been done in the past year and indications are that even a greater amount will be done the coming season.

Lands.—Demand increasing and prices are tending upward.

Report of Fair.—Held at Britt, Sept. 5-7. Owing to unfavorable weather the attendance was not as large as expected, but nevertheless the fair was pronounced a success in every particular, and more than the usual interest was taken in exhibits. Receipts were enough to pay all expenses and premiums in full and leave a small balance.

HARDIN.

H. S. MARTIN, ELDORA, OCTOBER 16, 1905.

General Condition of Crops and Season.—Good.

Corn.—Well matured before killing frosts and will yield an excellent crop.

Oats.—Yield light but of excellent quality.

Wheat.—Fair.

Barley.—Fair.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Very little raised.

Sorghum.—None raised.

Timothy.—Good.

Clover.—Good.

Other Grains and Grasses.—Fair.

Potatoes.—Yielded about half a crop and were of fair quality.

Vegetables.—Fair.

Fruits.—Grapes yielded a large crop and were of good quality. Plums, light crop.

Cattle.—In excellent condition.

Horses.—Are in good condition.

Swine.—Average number raised and are in good condition.

Report of Fair.—Held at Eldora, Sept. 5-8.

HARRISON.

W. H. WITHROW, MISSOURI VALLEY, OCT. 24, 1905.

General Condition of Crops, etc.—Weather conditions the past season have been very favorable to all crops, although the high winds created some havoc in the cornfields during the latter part of September. However, crops as a whole have been above the average of former years.

Corn.—Acreage planted was above that of last year, and the yield will be much better, although there will be considerable damaged corn by reason of the high winds having blown so much of it to the ground, which will cause it to rot.

Oats.—The usual acreage sown which yielded an average crop of fair quality.

Wheat.—Fall variety yielded much better than either winter or spring, and it will probably be more generally sown this season and the acreage increased.

Rye.—Usual acreage sown and yield and quality fair.

Barley.—Yield and quality below the average of former years.

Flax.—Very little raised, the soil apparently not being adapted to it.

Buckwheat.—Average crop.

Millet.—Average acreage, which yielded a good crop on the bench lands; not so good on the low lands on account of too much moisture.

Sorghum.—Average acreage; yield and quality good.

Timothy.—Crop very good on the bench lands, but not so good on the low lands.

Clover.—Yielded well on well drained land.

Prairie Hay.—A very heavy crop, and good seasonable weather in haying time assures a good supply for the coming winter.

Other Grains and Grasses.—None to mention excepting alfalfa, which is as yet an experiment. Several of our farmers have raised it successfully and think that this soil is adapted to the crop. The acreage planted the last season was much larger than any former year.

Potatoes.—Average acreage planted, which yielded a good crop and of excellent quality, particularly on land adjacent to the Missouri River, which soil seems to be well adapted to this vegetable.

Vegetables.—Were first class, both in yield and quality.

Apples.—Yielded a smaller crop than usual but were of fair quality.

Other Fruits.—Small varieties yielded an average crop and were of good quality. Peaches and pears are not extensively grown, but yield and quality fair.

Cattle.—The feeding industry has dropped off considerably in the last few years, those feeding heretofore claiming that there is very little profit in the business and are devoting their time and labor to more profitable industries.

Horses.—The horse raisers of this county have been somewhat careless for the last few years and have not raised the usual well-bred horses for which Harrison county was noted up to a few years ago; but we believe they have arrived at the conclusion that they have made a mistake and now propose to partially rectify it by again trying to raise a better class of horses.

Swine.—Every farmer in this county devotes considerable of his time and money to the raising and maturing of well-bred hogs, and they have done well the past season.

Sheep.—Not a great many raised or kept, although there are a few farmers who pay as much attention to this industry as to hog raising, and have been quite successful.

Poultry.—Not many farmers make this industry a business, yet there are several who devote considerable time to the raising of well-bred fowls.

Bees.—An average crop of honey, which is of excellent quality.

Drainage.—This is a question that has occupied the minds of farmers living on the low lands for several years, and is a problem that apparently is no nearer solution than at this time last year. Our board of supervisors deem it necessary that we have drainage and plenty of it, but a few people oppose this idea on account of the necessary expense.

Other Industries.—The creamery industry is almost a thing of the past in this county, there being but one or two plants in operation, managers claiming that there are not enough farmers interested to make the business pay, consequently have closed up their buildings and sold the machinery.

Land.—Values are about the same as for the past two years. The speculator investing in cheaper lands. Prices range from $20 per acre for low lands to $100 for choice, well drained farms.

Report of Fair.—Held at Missouri Valley, Oct. 2-5. The weather was exceptionally favorable, being clear and warm throughout the fair. The attendance was very light on the second day, but on the third day was a record breaker. Racing was good; live stock exhibits were better than usual.

Exhibits in the floral hall were not as large as in former years owing to some of our heaviest exhibitors showing at neighboring cities. When farmers do not take an active interest in an institution which is operated chiefly for their good with the intention of encouraging them in their life work, it would seem that those striving to assist them would become discouraged, but we hope that another year will demonstrate that the farmers' friends of the Harrison County Agricultural Society still have the best interests of the institution at heart and hereafter will not permit outside attractions to take away their pride in the success of their annual outing. Taken as a whole, the exhibits were never better in quality, if deficient in quantity, and another year I hope the society will be able to report that the farmers have once more shown that amount of interest that is necessary to make their meeting a successful one. We take pride in reporting that there was nothing in the way of immoral shows permitted on the ground, nor was there any intoxicating liquor therein and not a single case of imported intoxication seen on the grounds.

HENRY

C. M. CLARK, MT. PLEASANT, SEPT. 8, 1905.

General Condition of Crops and Season.—Good.

Corn.—Fair.

Oats.—Fair.

Wheat.—Small acreage, which yielded a fair crop.

Rye.—Very little raised.

Barley.—Very little raised.

Flax.—None raised.

Millet.—Fair.

Sorghum.—Fair.

Timothy.—Good.

Clover.—Good.

Prairie Hay.—None raised.

Other Grains and Grasses.—Abundant. Pastures excellent.

Potatoes.—Light yield of fair quality.

Vegetables.—Good.

Apples.—Poor.

Other Fruits.—Excellent.

Cattle.—In good condition; number assessed in the county 26,327.

Horses.—Are in good condition; number assessed 10,332.

Swine.—Have done well; no disease reported; number assessed 30,590.

Sheep.—Have done well; number assessed 13,620.

Drainage.—Good.

Lands.—Range in prices from $25 to $140 per acre.

Report of Fair.—Held at Mt. Pleasant, Aug. 15-18. The weather was favorable throughout the week and the attendance was large. Exhibits in every department were large and of excellent quality.

HENRY

WILL D. GARMOE, WINFIELD, OCT. 7, 1905.

General Condition of Crops, etc.—The season has been very favorable and crops generally have been very good.

Corn.—Will yield a large crop of excellent quality.

Oats.—Yielded a fair crop of good quality.

Wheat.—Very little raised.

Rye.—Small acreage; yield and quality fair.

Barley.—Small acreage sown.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Very little sown.

Sorghum.—Small acreage, but yield and quality good.

Timothy.—Good, both in yield and quality. Mostly cut for hay; there being very little seed saved.

Clover.—An excellent crop, both of hay and seed.

Prairie Hay.—None raised.

Other Grains and Grasses.—Excellent; pastures were never better.

Potatoes.—Fair yield and of good quality.

Vegetables.—Good.

Apples.—Small yield and of poor quality.

Other Fruits.—Yielded well and were of excellent quality.

Cattle.—Have done well and are in a healthy condition.

Horses.—A great many raised and are of good grade.

Swine.—With a few exceptions, have done well the past season and are in a healthy condition.

Sheep.—Industry increasing. Have done well the past season and are in a healthy condition.

Poultry.—Large number raised and have done well the past season. Raising of pure bred fowls increasing.

Bees.—Very few kept.

Drainage.—Good.

Lands.—Values are increasing.

Report of Fair.—Held at Winfield, Aug. 21-25. On account of unfavorable weather, attendance was not as large as expected but the fair was a success in every other particular, exhibits in every department being large and of excellent quality .

HUMBOLDT

JOHN CUNNINGHAM, OCT. 11, 1905.

General Condition of Crops, etc.—Good. The early part of the season was wet and necessitated replanting much of the corn on low ground. There has been no frost up to date.

Corn.—Of good quality and will yield an average of 35 bushels per acre.

Oats.—Quality good and will average thirty-two bushels per acre.

Wheat.—No winter wheat sown, spring wheat yielded well and was of good quality.

Rye.—Very little sown; yield and quality good.

Barley.—Very little sown; yield and quality good.

Flax.—Very little grown.

Buckwheat.—None raised.

Millet.—Very little sown.

Sorghum.—Very little raised.

Timothy.—Hay crop good; selling at $4 per ton in stack. Seed crop fair.

Clover.—Hay crop good; selling for $4 per ton in stack. Seed crop fair.

Prairie Hay.—Good. Selling for $3 per ton in stack.

Other Grains and Grasses.—Good.

Potatoes.—Poor, selling for fifty cents per bushel.

Vegetables.—Good.

Apples.—Early varieties good; late varieties fair.

Other Fruits.—Good.

Horses.—Scarce. Are in good condition; prices high.

Cattle.—Are in good condition.

Swine.—No disease is reported. Many raised.

Sheep.—Are in good condition and free from disease.

Poultry.—Smaller number raised than usual; are in good healthy condition.

Bees.—Very few kept.

Drainage.—There are sixteen drainage petitions before our board of supervisors. Eight contracts have been let. Considerable tiling has been done.

Other Industries.—Are flour mills, cold storage plant and bottling works and all report prosperous business.

Lands.—Very few transfers; prices range from $55 to $100 per acre.

Report of Fair.—Held at Humboldt, Sept. 12-15. The attendance was very good, although the weather was theatening throughout the week. Exhibits were good in every department and premiums were paid in full. The racing was also very good, and the fair was pronounced a success in every particular.

IOWA

C. C. CLEMENTS, MARENGO, SEPT. 2, 1905.

General Condition of Crops and Season.—Good.

Corn.—That which was planted on high and well drained land will yield a large and excellent crop, while that on the low and poorly drained land was drowned out early in the season.

Oats.—Good, both in quality and yield.

Wheat.—Small acreage, but yield and quality good.

Rye.—Small acreage; yield and quality excellent.

Barley.—Good yield; but some discolored grain.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Good; small acreage.

Sorghum.—Small acreage, but yielded a fair crop.

Timothy.—Yielded a heavy crop but was put up in poor condition on account of heavy rains at haying time.

Clover.—Yielded a heavy crop but was damaged to some extent by rains at haying time.

Prairie Hay.—None raised.

Other Grains and Grasses.—Pastures have been excellent.

Potatoes.—Good, both in quality and yield.

Vegetables.—Good.

Apples.—Small crop. Injured by locust.

Other Fruits.—Medium crop.

Cattle.—Are in excellent condition. Demand good.

Horses. Heavy animals are scarce and command high prices, as is also true of roadsters.

Swine.—A great many raised. Present price $5.50 per hundred. No cholera reported.

Sheep.—Industry is growing.—Several large flocks of pure breds in this county.

Poultry.—An extensive industry. A great deal shipped from this county.

Bees.—Very little attention is given to this industry.

Drainage.—There are several tile plants in the county, which dispose of their product locally.

Other Industries.—Raising of sweet corn for canning purposes is a very profitable one, the canning factory here the past summer handling the product of 700 to 1200 acres.

Lands.—Range in price from $50 to $110 per acre.

Report of Fair.—Held at Marengo, Aug. 22-24. The attendance was very good and exhibits in all departments were large and excellent in quality, excepting in agricultural products which, owing to the early date of the fair, were not fully matured.

IOWA

J. P. BOWLING, VICTOR, SEPT. 18, 1905.

General Condition of Crops and Season.—Good.

Corn.—Good. Considered the best crop ever raised in this vicinity.

Oats.—Good.

Wheat.—Fair.

Rye.—Good.

Barley.—Large acreage, which yielded well and was of excellent quality.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Small acreage.

Sorghum.—Very little raised.

Timothy.—Good.

Clover.—Good.

Prairie Hay.—Good.

Other Grains and Grasses.—Good.

Potatoes.—Fair.

Vegetables.—Good.

Apples.—Poor.

Other Fruits.—Plums, good; cherries, good; strawberries, good; raspberries, fair; blackberries, poor; peaches, a failure.

Cattle.—A great many fine cattle raised in this county.

Horses.—Are in good condition.

Swine.—In good condition; no disease reported.

Sheep.—Very few raised.

Poultry.—Good.

Bees.—Very few kept.

Other Industries.—Creameries and flour mills report a profitable business.

Lands.—Prices high.

Report of Fair.—Held at Victor, Aug. 15-17.

IOWA.

CHAS. FLETCHER, WILLIAMSBURG, OCT. 13, 1905.

General Condition of Crops, etc.—The season has been an exceptionally favorable one for all agricultural products, and the hay, oat, and corn crop is above the average both in yield and quality.

Corn.—Will yield a large crop and of excellent quality.

Oats.—Good both in quality and yield.

Wheat.—Small acreage, but yielded well and was of good quality.

Rye.—Yield and quality fair.

Barley.—Very little sown.

Flax.—None raised.

Buckwheat.—None sown.

Millet.—None sown.

Sorghum.—None sown.

Timothy.—An excellent crop in both yield and quality.

Clover.—Above the average crop, both in yield and quality.

Potatoes.—Average yield and of excellent quality.

Apples.—Small yield and quality fair.

Cattle.—A great deal of interest is being taken in the breeding of fine cattle, and there are some fine herds of Shorthorns and Polled Angus.

Horses.—Decrease in the number raised. Farmers breeding for quality rather than quantity. Many are shipped to eastern markets.

Swine.—Marked improvement in swine the past three years. A great showing of Poland China, Duroc Jerseys and Chester Whites at our fair necessitated the building of additional pens.

Sheep.—Not raised to any great extent; an occasional flock of Lincolns and South Downs of exceptionally high grade seen.

Poultry.—This industry is on the increase and is recognized as a most profitable business.

Bees.—Very few kept.

Drainage.—This subject has been given much attention, farmers realizing that the present high price of farm lands will not admit of any going to waste when by drainage it can be reclaimed and made most productive.

Lands.—Have rapidly increased in value the past few years and prices now range from $65 to $125 per acre.

Report of Fair.—The Williamsburg District Fair Association held its eighth annual exhibition Sept. 12-14, and notwithstanding a heavy rain on the 14th, which necessitated extending the original dates one day, and with the additional expenses incurred thereby, it was the most successful fair in the history of the association. Many predicted a failure on account of having no trotting races, but were forced to admit that a fair can be made a success without racing. There were excellent attractions, clean, wholesome and educational, which fully met with the expectations of the visitors and caused expressions of commendation from all present. No gambling nor any show of an immoral nature was permitted on the grounds. All departments were well filled with excellent exhibits and visitors expressed themselves with being pleased with the educational features of the exposition.

All expert knowledge obtained from the judges in the different departments brought out practical ideas which will aid in making still greater advancement in the field of farm activity. Improved labor saving machinery, the rural mail delivery that carries the news to the farmer's door, the telephone system which puts the farmer in close touch with everybody and every place, renders farm life no longer the dry drudgery of the past, but places him in direct communication with neighbor, merchant or dealer in farm products, and by securing market reports by wire places him in a position to take advantage of favorable prices. Of these improvements the farmers have been quick to take advantage, and the result is a complete transformation in farm life. From the writer's personal observation, prudent economy, neatness and thrift seem almost universally characteristic of the farmers of Iowa county, and when farming is thus intelligently conducted there can be no more worthy occupation than this which renders service to the whole human race. Agricultural colleges, experiment stations, state boards of agriculture, fairs, judging contests, and farmers' institutes have all been important factors in furnishing the necessary technical education that has produced such splendid results.

JACKSON

B. D. ELY, MAQUOKETA, SEPT. 17, 1905.

General Condition of Crops and Season.—Better than for several years past.

Corn.—Large acreage planted, and yield and quality will be much above the average of the past several years.

Oats.—Yield and quality excellent.

Wheat.—Small acreage, which yielded well and was of good quality.

Rye.—Very little sown.

Barley.—This grain is becoming more popular among feeders and a much larger acreage was sown this year than last, which yielded a good crop of excellent quality.

Flax.—None grown.

Buckwheat.—Very little grown.

Millet.—Small acreage; yield and quality good.

Sorghum.—Very little grown.

Timothy.—Good yield and of excellent quality.

Clover.—Very good.

Prairie Hay.—Very little raised.

Potatoes.—Yielded well and were of excellent quality.

Vegetables.—Good.

Apples.—Light crop.

Other Fruits.—Good.

Cattle.—County well stocked with best grades.

Horses.—A considerable amount of breeding has been done the past few years, and in consequence the quality is improving and the number of young horses increasing.

Swine.—A great many spring pigs raised, and are in healthy condition.

Sheep.—Generally healthy and doing well, but no large flocks in this county.

Poultry.—A great deal of attention is paid to this industry, and farmers are selling in large quantities.

Bees.—A great many are kept in this county and a large amount of honey is shipped out.

Drainage.—Natural drainage is very good.

Other Industries.—Burning lime in an important one and the product of the two plants in this county is enormous.

Lands.—Remain the same in price as last year, some selling as high as $100 per acre.

Report of Fair.—Held at Maquoketa, Sept. 5-8. Although the weather was threatening every day we had the largest attendance and the most successful fair in the history of our society. The exhibits in every department were good, and especially was this true of the exhibit in the art hall and poultry and horse departments. The races were good and all attractions gave excellent satisfaction and all visitors were well pleased.

JASPER

C. W. CAMPBELL, NEWTON, SEPT. 21, 1905.

General Condition of Crops, etc.—Good. The early part of the season was very wet and much corn on low lands was drowned out, also some damage was done to small grain during harvest by rains

Corn.—Generally reported good, but many conflicting reports.

Oats.—Fair yield of extra good quality.

Wheat.—Fair yield; quality good.

Rye.—Small acreage but yielded a fairly good crop.

Barley.—Very little raised and was badly discolored.

Flax.—None raised.

Timothy.—An excellent crop, both in quality and yield.

Clover.—Good. First cutting damaged to great extent by rains.

Potatoes.—Early varieties good; late varies.

Vegetables.—Generally good.

Apples.—Poor.

Other Fruits.—Grapes good; raspberries and blackberries good.

Cattle.—In good condition. No disease or ticks reported.

Horses.—Good ones demand high prices.

Swine.—In good condition; no disease reported.

Sheep.—Small exhibit at fair, but animals shown were well bred.

Poultry.—A profitable industry, and the exhibit in this industry at our fair was large and many select birds were shown.

Bees.—Did fairly well. Season too wet for gathering a good crop of honey.

Lands.—Advancing in price, with very few farms for sale.

Report of Fair.—Held at Newton, Sept. 12-15. On account of unfavorable weather in the shape of heavy rains throughout the days of the fair, it was not the success it would otherwise have been.

JEFFERSON

R. C. SAYERS, FAIRFIELD, SEPT. 25, 1905.

General Condition of Crops, etc.—While the early part of the season was too wet, general condition of crops is good.

Corn.—Season was too wet for low and undrained land. Corn on the high and well drained land will yield a large crop of excellent quaity.

Oats.—Good.

Wheat.—Good; small acreage but yielded an average crop.

Rye.—Good.

Barley.—Very little raised.

Flax.—None sown.

Buckwheat.—Very little raised.

Millet.—Small acreage but yielded a good crop.

Sorghum.—Very little milled.

Timothy.—Good.

Clover.—An increase each year; crop good.

Prairie Hay.—None raised.

Potatoes.—Good.

Vegetables.—Large crop.

Apples.—Poor, both in quality and yield.

Other Fruits.—Fair, except peaches.

Catte.—Many good cattle raised.

Horses.—All classes are raised and good prices are obtained.

Swine.—Have done well; market good.

Sheep.—Not many raised or kept, but have done well the past season.

Poultry.—Good.

Bees.—Did not do well the past season.

Drainage.—Fair.

Other Industries.—Good.

Lands.—Farms are well improved and where sold bring good prices.

Report of Fair.—Held at Fairfield, Sept. 12-15. While the weather was unfavorable throughout the week, all departments were well filled with excellent exhibits.

JONES

E. E. HICKS, MONTICELLO, OCT. 23, 1905.

General Condition of Crops, etc.—The season was very favorable for all crops.

Corn.—Good.

Oats.—Good.

Wheat.—Small acreage but yielded well and was of good quality.

Rye.—Good.

Barley.—Good.

Flax.—None raised.

Buckwheat.—Small acreage, which yielded a fair crop of good quality.

Millet.—None raised.

Sorghum.—Fair yield, but was badly blown down.

Timothy.—Good

Clover.—Good.

Prairie Hay.—Very little raised.

Other Grains and Grasses.—Pastures were excellent.

Potatoes.—Yielded a large crop of good quality.

Vegetables.—Good.

Apples.—Small yield.

Other Fruits.—Not many grown.

Cattle.—Are in good condition.

Horses.—Are in good condition.

Swine.—Have done well. No disease reported.

Sheep.—Very few raised or kept, but did well the past season.

Poultry.—Good.

Bees.—Did not do very well.

Drainage.—A great deal of tiling being laid.

Other Industries.—Dairying is the principal industry. All creameries are in a prosperous condition. Manufacturing is carried on to some extent.

Lands.—Range in value from $75 to $100.

Report of Fair.—Held at Monticello, Aug. 28-Sept. 1. The exhibit in the cattle and horse departments was the largest in years. The poultry exhibit was also very large. There were no sheep on exhibit. Unfavorable weather prevented the attendance from being very large the first days of our fair, but on the last two the attendance was very good.

JONES

A. C. WATTERS, ANAMOSA, OCTOBER 2, 1905.

General Condition of Crops and Season.—Good

Corn.—Good; will yield from 50 to 60 bushels per acre.

Oats.—Good; yielded from 40 to 60 bushels per acre.

Wheat.—Small acreage, but yielded a fair crop.

Rye.—Small acreage, but will yield a good crop.

Barley.—None raised.

Flax.—None raised.

Buckwheat.—Very good.

Millet.—None raised.

Sorghum.—None raised.

Timothy.—Very good.

Clover.—Very good.

Prairie Hay.—None raised.

Other Grains and Grasses.—Very good.

Potatoes.—Fair.

Vegetables.—Good.

Apples.—None raised.

Other Fruits.—Good.

Cattle.—Good.

Horses.—Good.

Swine.—Good.

Sheep.—Very few raised or kept.

Poultry.—A growing industry and all poultry is in good condition.

Bees.—Did not do very well this season. Very few kept.

Drainage.—A great deal of tiling is being laid.

Other Industries.—Have been very prosperous this year.

Lands.—Range in price from $65 to $100 per acre.

Report of Fair.—Held at Anamosa, Aug. 14-18. Exhibits in all departments were large and excellent in quality, and the attendance was very good.

KEOKUK

GEO. A. POFF, WHAT CHEER, OCTOBER 2, 1905.

General Condition of Crops, etc.—Above the average.

Corn.—Excellent, both in quality and yield.

Oats.—Averaged thirty-five bushels per acre and were of excellent quality.

Wheat.—Small acreage, but yielded well and of good quality.

Rye.—Fair crop.

Barley.—Yielded about half an average crop, but was of good quality.

Flax.—Small acreage, but yielded a fair crop.

Buckwheat.—The usual acreage planted, which yielded a good crop.

Timothy.—Excellent, both in quality and yield.

Clover.—Excellent, both in quality and yield.

Prairie Hay.—Yielded a large crop and was put up in excellent condition.

Potatoes.—Small yield. Selling at forty-five cents per bushel.

Vegetables.—Did well.

Apples.—Small yield. Selling for seventy-five cents per bushel.

Cattle.—There is avery noticeable improvement in the quality of cattle being raised, and the number of breeders is increasing.

Horses.—Have done well. There are several large breeders in this county.

Swine.—A great many raised and there is a noticeable improvement in their quality.

Sheep.—Have done well, although there are not as many raised as in former years.

Poultry.—A great deal raised, and some fine birds were shown at our fair this year.

Bees.—Quite a number kept, and did well the past season.

Drainage.—More tiling than ever before is being done.

Lands.—Considerable has changed hands, prices ranging from $60 to $80 per acre.

Report of Fair.—Held at What Cheer, Sept. 11-14. All previous records were broken, both in attendance and extent and quality of exhibits. Nearly seven thousand tickets were sold on our "big" day. The last day was declared off on account of rain. All departments were crowded. The display of cattle and horses was exceptionally large. Attractions were good, which included the "Bombardment of Port Arthur" and side attractions of acrobatic work. The exhibition, as a whole, was the largest and most successful in the history of the society.

KOSSUTH

T. H. WADSWORTH, ALGONA, OCTOBER 12. 1905.

General Condition of Crops, etc.—The season has not been of the best, owing to excessive rainfall during the month of June, but the condition of all crops at this date is far above the average.

Corn.—Best crop raised in years. While the stand, perhaps, was not up to the standard, the quality is excellent.

Oats.—Yielded a good crop, but not quite as heavy as last year.

Wheat.—Small acreage, but yield and quality good.

Rye.—Very little grown.

Barley.—Good.

Flax.—Small acreage, but yield and quality good.

Buckwheat.—Small acreage, but yielded a good crop.

Millet.—Yield and quality good.

Timothy.—Yielded a good crop, which was put up in excellent condition.

Clover.—Good, both in quality and yield.

Prairie Hay.—Yielded a good crop and was put up in excellent condition.

Other Grains and Grasses.—Did well, especially blue grass.

Potatoes.—Below the average crop, both in quality and yield.

Vegetables.—Fair crop; not as good as last year.

Apples.—Fair crop. Not as good as last year.

Other Fruits.—Good.

Cattle.—Good grades raised, and quite a number of thoroughbreds of the different breeds.

Horses.—Of good quality. Prof. Kennedy, of Ames, stated that we had the best horses and cattle on exhibit of any fair which he had attended this year, with the exception of the state fair.

Swine.—A great many raised. No cholera reported for several years.

Sheep.—This industry is increasing. While there are not as many flocks in the county as there should be, in the writer's opinion, yet the quality is very good.

Poultry.—An extensive and profitable industry.

Bees.—Have done well and honey crop is excellent.

Drainage.—Is in its infancy in this county, although there has been a great deal of tile laid and also a number of ditches put in.

Other Industries.—Dairying is a very profitable one and there are a great many creameries which are well patronized.

Lands.—Very little changing hands. Prices range higher than last year.

Report of Fair.—Held at Algona, Sept. 12-15. The exhibition was the most successful ever held in the history of our society. About two thousand dollars was raised by subscription this year, which was used in erecting three good buildings on our grounds, and we hope to continue improving our grounds and our fair each year.

LEE

CRIS HAFFNER, DONNELSON, SEPTEMBER 16, 1905.

General Condition of Crops, etc.—Crops have been below the average, owing to excessive rainfall in the early part of the season.

Corn.—Will be a fair crop both in quality and yield.

Oats.—Yielded on an average about thirty bushels per acre, and were of good quality.

Wheat.—Fair acreage, and quality the best in years.

Rye.—Small acreage, but of extra good quality.

Barley.—None raised.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—None raised.

Sorghum.—Yield and quality good.

Timothy.—Fair quality. Yielded in seed from three to six bushels per acre.

Clover.—Light crop.

Prairie Hay.—None raised.

Potatoes.—Fair yield but of good quality.

Vegetables.—Fair.

Apples.—Small yield but of good quality.

Other Fruits.—Fair.

Cattle.—Raised extensively. A great many feeders are shipped in from Kansas City and western markets, although very little profit has been made in feeding for market the past year.

Horses.—There is a good demand for heavy draft breeds, and prices range from $100 to $400.

Swine.—Are in good condition. No disease reported. Poland China is the principal breed raised, although there are some Chester Whites and Duroc Jerseys.

Sheep.—Not extensively raised. Middle wool breeds predominate.

Poultry.—Has been very profitable, and there is quite a noticeable improvement in the quality being raised.

Bees.—Did very well.

Drainage.—Good.

Other Industries.—Cheese factories have been quite successful.

Lands.—Range in price from $60 to $100 per acre, and are advancing.

Report of Fair.—Held at Donnellson, Aug. 22-24. Exhibits were good in all departments. The weather was unfavorable, with the exception of one day, on which the attendance was very good.

LEE

JOHN KEMPKER, WEST POINT, SEPTEMBER 23, 1905.

General Condition of Crops, etc.—The season was rather too cold and wet for corn and oats, but corn at this writing is out of danger from frost and will average about half a crop. A great deal was drowned out by early rains and had to be replanted.

Corn.—Will yield from twenty-five to thirty bushels per acre of good quality.

Oats.—Averaged about half a crop; of good quality. Season was very wet at cutting time and it was impossible to get at a great deal of it with machines. Yielded from twenty to twenty-five bushels per acre.

Wheat.—Small acreage, but yield and quality good. Mostly fall variety raised.

Rye.—Good quality and yielded on an average twenty bushels per acre.

Barley.—None raised.

Flax.—None raised.

Buckwheat.—Small acreage, but indications at this time are that it will yield a good crop.

Millet.—Good both in quality and yield.

Sorghum.—Damaged to some extent by winds. An excellent grade of molasses is produced and yields about eighty gallons per acre.

Timothy.—Of good quality, and yielded about one and one-half tons per acre.

Clover.—First crop damaged to some extent by rains at cutting time, but indications are that second cutting will yield a good crop both in seed and hay.

Prairie Hay.—None raised.

Potatoes.—Season too wet. Irish potatoes yielded about half a crop of fair quality, while sweet potatoes yielded about one third crop of good quality and are selling for sixty cents a bushel.

Vegetables.—Good.

Apples.—Yielded about one-third the usual crop and were of fair quality.

Other Fruits.—Plums, good; strawberries, half a crop; grapes, good; blackberries, good; peaches, very light crop.

Cattle.—Are in excellent condition, owing to pastures being exceptionally good. No disease reported.

Horses.—Are in excellent condition, and demand is good for all grades.

Swine.—The spring was unfavorable for pigs, owing to being exceptionally wet and cold, but all hogs are doing well at this time and no disease is reported. Old stock is mostly all sold off and good prices were obtained.

Sheep.—Have done well.

Poultry.—Have done well and good prices are obtained.

Bees.—Have done well.

Drainage.—Some tiling is being done.

Other Industries.—Manufacturing of brick to a small extent, and we understand that the parties contemplate making tile the coming spring. Canning of tomatoes is carried on to some extent.

Lands.—Prices are high, very little changing hands.

Report of Fair.—Held at West Point, Aug. 29-31. This was the thirty-fourth annual exhibition of the West Point Agricultural society. The weather was exceptionally favorable throughout the days of the fair, and about five thousand people were in attendance. Exhibits were good in all departments, and the fair was pronounced a success in every particular.

LINN.

E. HEATON, FAIRFAX, SEPTEMBER, 28, 1905.

General Condition of Crops and Season.—Good, although the fore part of the season was exceptionally wet. The latter part has been very favorable and all crops matured well.

Corn.—Good, with the exception of that which was planted on low, undrained land. Will average about fifty bushels per acre.

Oats.—Yielded about forty-five bushels per acre and were of good quality, overrunning in weight.

Wheat.—Small acreage but yiellded well and was of good quality.

Rye.—Very little raised.

Barley.—Small acreage.

Flax.—None raised.

Buckwheat.—None sown.

Millet.—Small acmeage but yield and quality good.

Sorghum.—Very little raised.

Timothy.—Yielded a good crop and was put up in excellent condition

Clover.—Yielded a large crop, but was not put up in very good condition.

Prairie Hay.—None raised.

Potatoes.—Fair yield and of good quality.

Vegetables.—Good.

Apples.—Scarce.

Other Fruits.—Good.

Cattle.—Are in good condition.

Horses.—A great many raised and heavy breeds are in good demand.

Swine.—Doing well; no disease reported.

Sheep.—Very few raised.

Poultry.—Has done well. More raised than last year.

Bees.—Have done fairly well.

Drainage.—A great deal of tiling is being done.

Lands.—Very little changing hands; prices average about one hundred dollars per acre.

Report of Fair.—Held at Fairfax, Aug, 29, Sept. 1. The weather was favorable, with the exception of one day, and the attendance was very good, as was also the exhibits in all departments. Premiums were paid in full, and the fair pronounced a success in every particular.

LINN.

E. E. HENDERSON, CENTRAL CITY, OCT. 11, 1905.

General Condition of Crops and Season.—Good.

Corn.—Fully matured; best in years, both in quality and yield.

Oats.—Fairly good yield, but many complaints of light weight .

Wheat.—None raised.

Rye.—Good quality and yielded from fifteen to twenty-five bushels per acre.

Barley.—Good.

Flax.—None raised.

Buckwheat.—Small acreage. Yield and quality fair.

Timothy.—Average yield of good quality.

Clover.—Good.

Other Grains and Grasses.—Pastures were excellent.

Potatoes.—Small yield, but of good quality.

Apples.—Very light crop, and of poor quality.

Cattle.—Are in good condition. A good grade is raised and an unregistered male is an exception.

Horses.—Are in good demand.

Swine.—Not as many raised as usual, but are in a healthy condition. There is good demand for breeding stock.

Sheep.—This industry is increasing. Flocks range in number from ten to fifty head.

Bees.—Have not done well, the season being a poor one for honey.

Drainage.—A large amount of tiling is being laid. Tile factories have been in operation all season and nearly their entire out put is used by local trade.

Lands.—Range in price from $60 to $100 per acre. Very little changing hands.

Report of Fair.—Held at Central City, Sept. 12-15. The exhibits in the live stock department were the largest we have had for several years. The judging was done by Prof. Kennedy of Ames, who pronounced the exhibit the best he had ever passed on in Iowa outside of the State fair. The fair was a success financially, although the attendance was not as large as last year, owing to the weather being unfavorable on Thursday, the 14th. A permanent water works system has been installed on the grounds the past year.

LOUISA.

J. J. STAPP, COLUMBUS JUNCTION, OCT. 20, 1905

General Condition of Crops and Season.—Although the early part of the season was exceptionally wet, the latter part of the season has been favorable and the general condition of crops is good.

Corn.—Above the average crop, both in yield and quality.

Oats.—Yielded from twenty-five to fifty bushels per acre, and of good quality.

Wheat.—Small average, but yielded a fair crop of good quality.

Rye.—A good average crop.

Barley.—Above the average yield, but damaged to some extent in harvesting.

Flax.—Very little raised.

Buckwheat.—Very little raised, but of average yield and quality.

Millet.—Good.

Sorghum.—Good.

Timothy.—Above the average.

Clover.—Above the average.

Prairie Hay.—None raised.

Other Grains and Grasses.—Excellent.

Potatoes.—Good.

Vegetables.—Excellent.

Apples.—Yield and quality poor.

Other Fruits.—Good.

Cattle.—Not as many raised as usual, but are in good condition.

Horses.—There is a noticeable improvement in their breedings. Prices are good for draft classes.

Swine.—Average increase and are in good condition.

Sheep.—Increase in number raised, and are of good quality.

Poultry.—A profitable industry. More raised this year than usual.

Bees.—Fair crop of honey.

Drainage.—More tile has been laid the past twelve months than in five years past.

Other Industries.—Prosperous. Developed to meet the demands.

Lands.—Have increased in price from $5 to $15 per acre the last year.

Report of Fair.—Held at Columbus Junction Sept. 5-8. The weather was somewhat unfavorable, but all departments were well filled with the exception of speed, which department needs some revision.

LOUISA.

C. M. DONALDSON, WAPELLO, OCT. 17, 1905.

General Condition of Crops' Etc.—The early part of the season was quite cool with copious rainfall, followed later by warmer weather with a very limited rainfall. Showers were frequent enough, however, to keep crops in good growing condition.

Corn.—Large acreage; average production; excellent quality.

Oats.—An average crop in acreage, yield and quality.

Wheat.—Somewhat above the average in acreage, yield and quality.

Rye.—Not up to the stndard, either in acreage of yield.

Barley.—Small acreage.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Very little raised.

Sorghum.—Not as much raised of late years as a few years ago, however, is of fine quality.

Timothy.—Not up to the standard in acreage or production, but was of good quality.

Clover.—Not up to the average. Very few fields of pure clover.

Prairie Hay.—None raised.

Potatoes.——Large acreage, but production light; quality fairly good.

Vegetables.—Good.

Apples.—Light yield.

Other Fruits.—Strawberries, raspberries, blackberries, plums and grapes yielded well and were of excellent quality.

Cattle.—The breeding of cattle has received quite an amount of attention; all principal breeds are represented.

Horses.—This industry has kept pace with all others, in the breeding of both draft and light harness classes.

Swine.—There is more attention paid this industry than formerly. No cholera this year.—Spring production or pigs good.

Sheep.—Not generally kept, but there are a number of flocks in the county.

Poultry.—Quality is improving.

Bees.—Quite a number raised. Production of honey the past season was very good, but hardly up to that of last year.

Drainage.—Natural drainage is very good.

Other Industries.—A Canning factory with a production of over two million cans this year. A strong effort is being made to secure a beet sugar factory.

Lands.—Much improved in the last few years by better farming. Prices range from $60 to $80 per acre.

Report of Fair.—Held at Wapello, Aug. 29-Sept. 1. The weather was exceptionally good for our meeting and the attendance was above the average. Entries were light in some departments, and especially was this true in the speed division.

MADISON.

W. H. VANCE, WINTERSET, OCT. 7, 1905.

General Condition of Crops and Season.—Good. Although we had considerable rain the early part of the season, harvest time and the latter part of the season has been very favorable for all crops.

Corn.—Large acreage, which will yield an excellent crop.

Oats.—Acreage not so large as last year, but yield and quality good.

Wheat.—Small acreage, but yield and quality good.

Rye.—Very little raised, but yielded a fair crop.

Barley.—Very little raised but yielded a good crop.

Flax.—None raised.

Buckwheat.—Small acreage sown, but promises a fair yield.

Millet.—Small acreage, but yield and quality good.

Sorghum.—Small acreage, but of extra good quality.

Timothy.—Yielded a large and excellent crop of hay, but seed crop very light.

Clover.—Yielded a large crop of hay, which was put up in excellent condition. Seed crop light.

Prairie Hay.—Very little raised, but yielded a good crop and was put up in excellent condition.

Potatoes.—Small yield but of good quality, selling for thirty-five cents per bushel.

Vegetables.—Good.

Apples.—Light yield and of poor quality.

Other Fruits.—Strawberries, raspberries, blackberries, cherries, gooseberries, currants, plums and all other small fruits yielded a large crop of excellent quality.

Cattle.—Have done well and a large number will be fed for market. Price for feeders range from tree and a half to four cents per pound.

Horses.—County is noted for the fine grade of both draft and roadster classes. Prices have been good and a great many have been shipped out.

Swine.—Large number raised. Poland Chinas predominate, with a considerable number of Duroc Jerseys and Chester Whites, and a few Berkshires.

Sheep.—Have done well.

Poultry.—An increase in the number raised. A great deal of dressed poultry is shipped out.

Bees.—Probably about the same number or hives as last year, but honey crop lighter.

Drainage.—Excellent natural drainage, but the flatter portions are rapidly being tiled.

Other Industries.—There is an excellent quality of limestone in this county, which with proper railroad facilities could be developed and made a paying industry.

Lands.—Very little changing hands. Prices range from $50 to $110 per acre. One sale made recently at $116.50 per acre.

Report of Fair.—Held at Winterset, Sept., 26-29. The original date set was Sept., 5-8, but postponed on account of rainy weather. The weather was very favorable during the week in which the fair was held, and the attendance was large, as were the exhibits in every department; the exhibition was pronounced a success in every particular.

MAHASKA.

T. R. OSBORNE, NEW SHARON, SEPTEMBER 25, 1905.

General Condition of Crops and Season.—Good.

Corn.—Prospects give promise of a splendid crop both in quality and yield, except that which was planted on low, undrained land.

Oats.—Above the average of the last three years, both in quality and yield.

Wheat.—Small acreage, but yield and quality good.

Rye.—Small acreage but of fair quality.

Barley.—Good, both in quality and yield.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Fair.

Sorghum.—Good.

Timothy.—Good. Yielded in seed from three to four bushels per acre.

Clover.—Good.

Prairie Hay.—None raised.

Other Grains anl Grasses.—Pastures were never better.

Potatoes.—Early varieties good, while late varieties were only fair.

Vegetables.—Good.

Apples.—Fair.

Other Fruits.—Cherries and all small fruits were excellent, while peaches were a total failure.

Cattle.—Have done well, and are in good condition.

Horses.—A great many raised and command good prices.

Swine.—Large numbers raised. No disease of any kind reported

Sheep.—Are well bred, and there is an increase in the number raised.

Poultry.—Raised extensively; prices good.

Bees.—Have done very poorly this year.

Drainage.—A great deal of tiling is being done.

Lands.—Range in prices from $60 to $110 per acre.

Report of Fair.—Held at New Sharon, Sept., 19-22. The attendance was a record breaker. All departments were well filled with excellent exhibits, and in the cattle department it was necessary to build an additional barn and lease a large tent to accommodate a herd of six Herefords shown by Messrs Way & Son. The principal attraction was a Wild West Show, which proved a success. All premiums will be paid in full, and after paying all expenses we will have a balance in the Treasury.

MARION.

CHAS. PORTER, PELLA, OCT. 30, 1905.

General Condition of Crops and Season.—Good, although the seeding and planting season was a few days late, but the very favorable fall has given crops time in which to mature.

Corn.—Will yield a fair crop, especially on rolling and tile drained land, and the quality will be excellent.

Oats.—Yielded a fair crop, and quality better than for the past three years.

Wheat.—Small acreage but yielded a fair crop of good quality.

Rye.—Very little raised.

Barley.—An average crop, both in yield and quality. Larger acreage sown than usual.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Small acreage, but yielded a fair crop of good quality.

Sorghum.—Larger acreage planted than usual, which yielded a good crop of excellent quality. This has proved a profitabe crop where the seed is threshed.

Timothy.—Mostly sown with clover for hay, which yielded a good crop the past season.

Clover.—Is principally sown with small grain as a fertilizer in rotation of crops. First cutting yielded a fair crop of hay, but no seed was gathered from second cutting.

Prairie Hay.—None in this county.

Other Grains and Grasses.—Blue grass is our main pasturage, and where land has been seeded down for tnee years or more the crop is excellent.

Potatoes.—Early varieties good, both in quality and yield, while the late varieties will yield only a fair crop but of good quality.

Vegetables.—Good.

Apples.—Yielded a light crop and were of poor quality.

Other Fruits.—Peaches, none; all American varieties of plums produced an excellent crop of good quality.

Cattle.—Have done well, and the price of stockers and cows has been good, with a demand for dairy cows especially.

Horses.—The usual number raised. Prices high, especially for heavy draft classes.

Swine.—Large increase; much improvement shown in breeding. No disease reported.

Sheep.—This industry has proved a profitable one and the number raised in this county has increased rapidly the past few years.

Poultry.—Extensively raised. One of the most profitable industries of the farm.

Bees.—Did fairly well.

Drainage.—A larger amount of tile has been laid than in any proceeding year. The output of our tile factory is consumed locally.

Other Industries.—A factory manufacturing attachments for threshing machines is an extensive one and employs a large force of men. Tomatoes did not yield as heavy a crop as usual, but were of good quality. The pickle crop was excellent.

Lands.—Are gradually increasing in value.

Report of Fair.—Held at Pella, October 3-6. The fair was the most successful ever held in the history of this society. Favorable weather prevailed throughout the week and a great deal of interest was shown in the exhibits in every department. The Iowa State Agricultural College furnished us a competent judge of corn, who gave information to the patrons of the fair in the selection and care of seed corn, corn raising and feeding qualities. Our association still maintains that an agricultural fair should be held without any kind of gambling devices being allowed on the grounds, and the 1905 fair was no exception to this rule.

MARSHALL COUNTY.

BEN RICHARDS, RHODES, OCTOBER 23, 1905.

General Condition of Crops, Etc.—The season was exceptionally wet, but the general average of crops is up to that of former years.

Corn.—Corn will compare well with that of previous years. In some localities it is badly down, which will make very hard picking, and some soft corn, but as a whole will yield a very good crop.

Oats.—Yielded about enough to pay cost of raising and rental of ground.

Wheat.—Very little raised. Averaged about eight bushels per acre, and of fair quality.

Rye.—Small acreage, which yielded about thirty-five bushels per acre and was of good quality.

Barley.—Small acreage, but of good quality.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Very little raised.

Sorghum.—Very little raised.

Timothy.—Yielded a light crop, averaging about one ton per acre.

Clover.—Yielded two fairly good crops, although the first cutting was damaged to some extent by rains.

Prairie Hay.—None grown.

Potatoes.—Of good quality but yielded a light crop, not averaging over seventy-five bushels per acre.

Vegetables.—Good.

Apples.—Poor.

Other Fruits.—Poor, with the exception of plums, which yielded an abundant crop of excellent quality.

Cattle.—Are well bred and in good condition. There are plenty of feeders and a large number were shipped during the year.

Horses.—Scarce, and prices high.

Swine.—The production of pigs was large; they are in a healthy condition.

Sheep.—Very few are raised, but a good many are fed in the northern part of the county for market.

Poultry.—The season was favorable for chickens, but very poor for turkeys.

Bees.—A splendid year for them. A good crop of honey was gathered and is selling at a reasonable price.

Drainage.—Some tiling is being laid.

Lands.—Remain about the same in price as last year.

Report of Fair.—Held at Rhodes, October 3-5. As this was the first fair held by our association for three years much interest was taken. The weather was exceptionally favorable and the attendance good. There were no races, as we have no track.

MILLS.

I. J. SWAIN, MALVERN, SEPTEMBER 28, 1905.

General Condition of Crops, Etc.—The season has been ideal throughout, with sufficient moisture at all times, except perhaps about two weeks just after seeding time, when it was too dry, causing slight damage to oats. With this exception all crops are abundant and of excellent quality.

Corn.—Will be far above the average crop both in quality and yield. There is widespread complaint of corn having been blown down by heavy rains, but the yield will not be affected and will average about forty bushels per acre.

Oats.—Good quality, and fair, average yield, ranging from thirty to sixty bushels per acre.

Wheat.—Yielded from fifteen to twenty bushels, and was of excellent quality.

Rye.—Good, both in quality and yield.

Barley.—Small acreage, but of good quality and average yield.

Flax.—None grown.

Buckwheat.—None grown.

Millet.—Very little grown.

Sorghum.—None grown.

Timothy.—Quality excellent; yield somewhat below the average. That stacked was damaged to some extent by heavy rains in August and September.

Clover.—Yielded an abundant crop; considerably damaged by rain at cutting time.

Prairie Hay.—Yielded above the average crop and was of excellent quality.

Potatoes.—Yielded a light crop but of good quality.

Vegetables.—Good.

Apples.—Light crop. Some varieties a total failure. Yield materially reduced by windstorm. Quality good.

Other Fruits.—All small varieties yielded an abundant crop of good quality. Peaches a failure.

Cattle.—Conditions are about normal as to breeding and feeding. No disease has been reported. All cattle are in good flesh and condition to go through winter. Prices good.

Horses.—Renewed activity in breeding and raising is noted. Prices are high. Good horses are bought and shipped to other markets as they mature.

Swine.—The increase is probably a little above the average and of better growth than in 1904. No disease is reported.

Sheep.—Very few raised. A great many are shipped in and fed for the markets, which industry appears to be profitable.

Poultry.—A growing and profitable industry.

Bees.—Very little attention paid to this industry.

Drainage.—Much has been done in the past year to improve farms by draining the low lands, the cost of which has been repaid in larger returns from more tillable acres.

Land.—Values are steadily increasing. Present prices range from $75 to $125 per acre.

Report of Fair.—Held at Malvern, September 5-7, during one of the rainiest weeks of the year; as a consequence the society came out in debt, but as ever has been their practice, premiums and every liability were paid in full. All departments fairly well fielled, and the exhibits of horses and swine were excellent.

MITCHELL.

W. H. H. GABLE, OSAGE, OCTOBER 20, 1905.

General Condition of Crops, Etc.—The season was exceptionally favorable, and generally speaking all crops were good.

Corn.—Usually good. Crop fully matured before frost.

Oats.—An excellent crop, both in quality and yield.

Wheat.—Very little raised.

Rye.—Considerable is raised in this county, and yielded an average crop.

Barley.—Good, both in quality and yield.

Flax.—Very little raised.

Buckwheat.—Small acreage, but yield and quality good.

Millet.—An excellent crop.

Sorghum.—Very little raised.

Timothy.—Smaller acreage than usual, but yielded a good crop.

Clover.—Above the average.

Prairie Hay.—Good average crop.

Other Grains and Grasses.—Good.

Potatoes.—Not as large acreage as usual, but yielded a good crop.

Vegetables.—Excellent.

Apples.—Fair average.

Other Fruits.—Good, both in quality and yield.

Cattle.—Are raised extensively, and are mostly of the better grade; some very fine herds of Shorthorns, Angus, Galloway and Jerseys.

Horses.—Are of the best grades and sell well in the market. The breeding of fine horses is on the increase. Imported draft and coach horses appear in different parts of the county.

Swine.—A great many raised, and are of good quality. Poland China and Duroc Jersey breeds predominate.

Sheep.—This department at our fair made a very creditable showing, as also did the Angora goats.

Poultry.—Interest in this industry is increasing. All breeds were represented at our fair.

Other Industries.—Building stone abundant; also lithograph stone quarries are being opened near Osage.

Lands.—Farm lands in this county are of the very best, being excelled nowhere in the state. They are fairly level, dotted with artificial and natural groves, and several beautiful streams traverse different parts of the county; water is of excellent quality.

Report of Fair.—Held at Osage, September 12-15. This was the forty-first annual exhibition of our society, and it was pronounced a success in every particular. The attendance on the second day exceeded that of any day in the history of our organization. The grounds were free from all games of chance and no disreputable shows or booths were permitted. Exhibits were exceptionally attractive and all classes were well filled; especially was this true of the exhibits in the art hall The educational department, through the courtesy and effort of our efficient county superintendent, was one of the most attractive and interesting features of the fair, showing merits in many departments of our district schools. The demonstrations by Miss Rausch of Ames in domestic science on "Ladies' Day" contributed greatly to the interest of the fair. Our stock was judged by an Ames expert, to the entire satisfaction of all concerned. Farmers in this county are prosperous, happy and contented.

MONTGOMERY.

F. S. SCHADEL, RED OAK, OCTOBER 14, 1905.

General Condition of Crops and Season.—Good.

Corn.—Good.

Oats.—Good.

Wheat.—Good.

Rye.—Small acreage but of good quality.

Barley.—None raised.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—None raised.

Sorghum.—Very little raised but yield and quality good.

Timothy.—Good.

Clover.—Good.

Prairie Hay.—Good.

Other Grains and Grasses.—Good; pasturage was never better.

Potatoes.—Good.

Vegetables.—Good.

Apples.—Light crop.

Other Fruits.—Light crop.

Cattle.—Are in good condition.

Horses.—Are in good condition and more breeding is being done than in the past.

Swine.—A great many raised and are in good condition.

Sheep.—Very few raised.

Poultry.—Good.

Bees.—Very few in the county, but did well the past season.

Report of Fair.—Held at Red Oak, August 21-25, and it was pronounced the best exhibition ever held in the history of this society. The weather was very favorable throughout the week and the attendance fair. We account for the attendance being light on account of there being many other attractions in the county prior to the date of our fair.

MUSCATINE.

W. H. SHIPMAN, WEST LIBERTY, OCTOBER 21, 1905.

General Condition of Crops, Etc.—Although the early part of the season was somewhat late, summer and fall have been all that could be desired. The general condition of crops is good.

Corn.—Quality good; much benefited by late fall. No killing frost until October 10th.

Oats.—Fair yield and quality good.

Wheat.—Very little raised.

Rye.—Small acreage but yielded a fair crop of good quality.

Barley.—Yield and quality good.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Light yield.

Sorghum.—Good yield.

Timothy.—Yield and quality good; commands a good price.

Clover.—First cutting good; second cutting excellent.

Prairie Hay.—None grown.

Potatoes.—Light yield and of only fair quality.

Vegetables.—Good.

Apples.—Light yield and of poor quality.

Other Fruits.—Cherries good, both in quality and yield; berries of all kinds, fair crop.

Cattle.—Are in good condition. Nearly every farmer in this county is a breeder to some extent. Shorthorns predominate.

Horses.—Draft breeds predominate, with some trotting bred coach horses. There are two coach horse establishments at this point, which fit "high steppers" for the eastern markets. There is a good demand for finished horses of either class.

Swine.—Are in good condition. No cholera reported. Principal breeds are Poland China, Duroc Jersey, and a few Chester Whites, Tamworths and Yorkshires.

Sheep.—A few raised in the county, which are mostly of mutton breeds.

Poultry.—A great deal raised. In chickens Barred Rocks and Brahmas predominate. No disease reported.

Bees.—Very few kept.

Other Industries.—A condensed milk factory has been in operation over a year, which consumes upwards of 15,000 pounds of milk a day, *Sorghum.*—Very little raised.

Timothy.—Good.

Clover—Yielded a good crop and was put up in excellent condition. We believe there was but little seed saved.

Potatoes.—Good.

Vegetables.—Splendid.

Apples.—Up to a few years ago there were but few orchards in this county; since that time many trees have been set out and now there are more apples raised than can be consumed locally.

Other Fruits.—Good.

Cattle.—Every farm is well stocked, though there are not as many raised as a few years ago. Neither are there as many being fed for market as usual.

Horses.—Prices are high and a great many are being shipped out.

Swine.—The increase was large last season, and owing to there being some cholera prevalent, breeders are marketing shoats.

Sheep.—Have done well in this section and there is a tendency among the farmers to raise more of them, due, perhaps, to high prices which have prevailed the last two years.

Poultry.—Great many raised. Good prices have been obtained for both eggs and poultry.

Bees.—A great many are kept in this county and farmers generally report a good crop of honey the past season, although the average per hive is not so large as last year.

Drainage.—A great deal of attention is being paid to this matter, and nearly every farmer is laying some tile. There will be one drainage ditch opened in this county in the spring, I understand, under the new drainage law.

Lands.—Prices are steadily increasing, and it is predicted that $100 per acre will soon be the popular price.

Report of Fair.—Held at Sutherland, August 29—September 1. It was the general opinion that it was the best exposition ever held by this society. The attendance was good throughout, and after paying all premiums and expenses, there remained in our treasury a balance of $400.

O'BRIEN.

J. L. MCLAURY, SHELDON, SEPTEMBER 25, 1905.

General Condition of Crops and Season.—Good, although the forepart of the season was too wet.

Corn.—Of A-1 quality and will yield on an average about thirty bushels per acre.

Oats.—Yielded about forty bushels per acre, of fair quality. Damaged to some extent by rains.

Wheat.—Yielded about twelve bushels per acre; of fair quality.

Rye.—Small acreage but yielded a good crop.

for which a good price is paid. There is good demand for the finished product, and the business has been very satisfactory to both manufacturer and farmer.

Lands.—Range in price from $100 to $150 per acre, and where rented bring from $4 to $5 per acre.

Report of Fair.—Held at West Liberty, Iowa, August 22-25. Rain on Thursday, the 24th, cut down receipts to some extent, but aside from this we had a very successful fair. The exhibits in the swine and cattle departments were exceptionally good, and all other departments were well filled. The liberal premiums which we offer bring out the exhibitors and we do not have to depend on merchants displays to fill the space.

MUSCATINE

THOMAS BOOT, WILTON JUNCTION, SEPTEMBER 12, 1905.

General Condition of Crops, Etc.—The season has been very favorable for small grains and pastures. The yield of small grain was excellent, but damaged to some extent by rain during harvest.

Corn.—Present prospects are that it will be well matured and yield from forty to fifty bushels per acre.

Oats.—Of good quality, and yielded about forty bushels per acre.

Wheat.—Winter variety yielded about thirty bushels to the acre of fair quality, and a small acreage of spring wheat yielded on an average of fifteen bushels per acre.

Rye.—Small acreage, which yielded about thirty-three bushels to the acre.

Barley.—Averaged about twenty-two bushels per acre, but was damaged to some extent by rain during harvest.

Flax.—None raised.

Buckwheat.—Early variety yielded about ten bushels per acre, while the late variety yielded about fifteen.

Millet.—None raised.

Sorghum.—Very little grown, but yielded a fair crop.

Timothy.—Yielded from one and a half to two tons per acre, but was damaged to some extent by rain.

Clover.—Good yield, but damaged to some extent by rains.

Prairie Hay.—None grown.

Other Grains and Grasses.—Spelt yielded about forty bushels per acre.

Potatoes.—Early varieties yielded a small crop of fair quality, while indications at this time are that late varieties will yield a large crop of excellent quality.

Vegetables.—Not as good as last year.

Apples.—Averaged about ten per cent of full crop.

Other Fruits.—Plums plentiful; berries yielded a large crop of excellent quality, while grapes yielded only about half the usual quantity.

Cattle.—A great many raised and are in good condition. There is a noticeable improvement in the grade being raised. Considerable feeding for market is being done.

Horses.—A great many draft horses are raised, with some trotting stock.

Swine.—Poland Chinas, Chester Whites, Duroc Jerseys, Berkshires, I. O. C.'s and Tamworths are the principal breeds raised. No disease reported.

Sheep.—A few raised in the county, which are mostly of Shropshire breed.

Poultry.—Has done well. Plymouth Rock is the principal breed raised.

Bees.—Swarmed well, but gathered very little honey the last season.

Drainage.—Considerable tiling is being done.

Lands.—Range in price from $75 per acre for unimproved to $122 for farms of fair improvements.

Report of Fair.—Held at Wilton Junction, September 12-16. All live stock departments were well filled with excellent exhibits, and especially was this true of the swine department where all space was taken and additional provision had to be made for the exhibit. The exhibit in the poultry department was much larger than for several years past. The agricultural and horticultural departments made a fair showing, while the culinary, domestic manufacture, and art departments were well filled. The attendance was very good on all days except the 14th, on which day it rained. There was a new organization of the society this year, which started out with $1,000 to its credit, bought the buildings of the old association, and built a new judges' stand and hog barn and increased the premiums in all departments. Had the weather been more favorable the attendance would have been a record breaker; however, the new organization is in good condition financially and another year hope to be favored with better weather during our exhibition.

O'BRIEN.

R. C. JORDAN, SUTHERLAND, OCTOBER 12, 1905.

General Condition of Crops, Etc.—The season was very favorable and crops have been good. No frost visited this section until Oct. 11.

Corn.—Good. Reported as being the best crop ever raised in this section. Will yield from thirty-five to fifty bushels per acre.

Oats.—Good. Did not yield as heavy as last year, but will average thirty-five bushels per acre.

Wheat.—Very little raised.

Rye.—Very little raised.

Barley.—Yielded a good crop but was somewhat discolored.

Flax.—Very little raised.

Buckwheat.—None raised.

Millet.—Very little raised.

Barley.—Yielded about twenty-two bushels per acre, and was of poor quality.

Flax.—Very little raised but of good quality.

Buckwheat.—Very little raised but of good quality.

Millet.—Good.

Sorghum.—None raised.

Timothy.—Good; above the average both in quality and yield.

Clover.—Above the average.

Prairie Hay.—Very little grown.

Potatoes.—Those planted on high and well drained land yielded well and were of good quality, while those planted on low, undrained lands rotted badly

Vegetables.—Good.

Apples.—Good. Above the average yield.

Other Fruits.—Good.

Cattle.—Are in good condition, owing to the season being very favorable for pastures.

Horses.—Are in good condition, owing to the abundance of pasturage.

Swine.—Are in excellent condition; no cholera reported.

Sheep.—Are in good condition.

Poultry.—In good condition.

Bees.—A great many are kept and farmers report them as doing well the past season. One farmer near Sheldon reports having sold seven thousand pounds of honey.

Drainage.—Natural drainage is very good, although some little tiling is being done.

Other Industries.—The chief industry is agriculture. There are seventeen banks in the county with a total capital of about $700,000, with deposits of about $2,000,000, seventy-five per cent of which is deposited by farmers.

Lands.—Range in price from $60 to $90 per acre, and rank well in comparison with any in the state.

Report of Fair.—Held at Sheldon, August 30—September 1. Total gate receipts were $3,049.50; about $2,600 was paid in the speed department for purses, $565.00 for attractions, and $600 in premiums.

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W. A. HENDERSON, CLARINDA, SEPTEMBER 14, 1905.

General Condition of Crops and Season.—Good.

Corn.—Extra good.

Oats.—Good.

Wheat.—Good.

Rye.—Very little raised.

Barley.—Good.

Flax.—Very little raised.

Buckwheat.—Fair.

Millet.—Very little raised.

Sorghum.—Good.

Timothy.—Good.

Clover.—Good.

Prairie Hay.—Light crop.

Potatoes.—Good.

Vegetables.—Good.

Apples.—Poor; yielded only about twenty per cent of the usual crop.

Other Fruits.—Grapes and plums good.

Cattle.—Are in good condition.

Horses.—Are in good condition.

Swine.—Are in good condition.

Sheep.—Have done well.

Poultry.—Have done exceptionally well.

Bees.—Not a great many kept, but did well the past season.

Lands.—Prices high.

Report of Fair.—Held at Clarinda, September 4—8. September 4th favorable weather; September 5th, rained all day; September 6th, rain and threatening weather; September 7th, rain and threatening weather; September 8th, morning was cloudy, clearing away about noon, which continued over the 9th.

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C. E. YOUNG, SHENANDOAH, OCTOBER 30, 1905.

General Condition of Crops, Etc.—The season has been very favorable and most crops have been good.

Corn.—Will yield from seventy to eighty bushels per acre.

Oats.—Yielded about forty bushels per acre.

Wheat.—Yielded from fifteen to twenty-five bushels per acre.

Rye.—Yielded from twenty-five to thirty bushels per acre.

Barley.—Yielded from twenty-five to thirty bushels per acre.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Very little raised.

Sorghum.—Very little raised, and that used principally for feed.

Timothy.—Yielded about three tons per acre and was of good quality.

Clover.—Good.

Prairie Hay.—None raised.

Potatoes.—Yielded about half the usual crop.

Vegetables.—Fair.

Apples.—Yielded a light crop, and of poor quality. Price ranged from $1.50 to $2.00 per bushel.

Cattle.—Are in good condition. Not many being fed for market this season.

Horses.—Good grades are in demand.

Swine.—Increase not so large as usual.

Sheep.—Very few raised or kept.

Poultry.—Spring rains interfered with the raising of chickens. Prices high.

Drainage.—A great deal of tile is being laid each year, farmers appreciating that it is very profitable.

Lands.—Range in price from $100 to $150 per acre.

Report of Fair.—Held at Shenandoah, August 14—18. Exhibits in all departments are large and of excellent quality. The attendance was good until Friday, when rain interfered and necessitated holding the fair over Saturday.

PALO ALTO.

P. V. HAND, EMMETSBURG, OCTOBER 25, 1905.

General Condition of Crops and Season.—Good; above the average of the past three years.

Corn.—A larger acreage than usual was planted and the stand was exceptionally good; most farmers took special pains in selecting, keeping and testing their seed.

Oats.—Was usually good where not allowed to stand in shock too long before threshing, which discolored it to some extent.

Wheat.—Very little grown.

Rye.—Small acreage, which yielded a fair crop of good quality.

Barley.—Good.

Flax.—Very little, if any, raised.

Sorghum.—None raised.

Timothy.—There is an increase each year in the acreage, and the past season yielded above the average crop, owing to there being plenty of moisture during the growing season.

Clover.—Is raised extensively and always does well in this locality.

Prairie Hay.—Excellent. Is being replaced rapidly by timothy, clover and blue grass.

Potatoes.—Yield above the average and quality good. Not enough to supply the local demand.

Vegetables.—Plentiful.

Apples.—This crop is the best ever raised in the history of the county. Quite a few were shipped to Minneapolis and St. Paul, which, to our knowledge, was never done before.

Cattle.—One of the chief industries of the county, in the production of stock, dairy and beef types. There are fifteen creameries in the county and all are doing a prosperous business. There are a number of farmers in the country who feed from twenty to five hundred head each year for market.

Horses.—There is a noticeable improvement in their breeding. Thoroughbred sires are almost exclusively used.

Swine.—There is an increased interest in the raising of a better grade of hogs, which have done well the past season. No cholera has been reported for six or seven years in this county.

Sheep.—Very few raised.

Poultry.—Has done well. Every farmer has a good supply, and the exhibit in this department at our fair was much larger than usual.

Bees.—Several parties in this county make a specialty of this industry, and enough honey was produced the past season to supply the local demand.

Drainage.—Our farmers realize that better drainage is needed, and the board of supervisors of our county have under consideration the establishment of some ten or twelve public ditches, and every farmer who can afford it is putting in some tile.

Lands.—Improved farms range in price from $55 to $65 per acre, while unimproved lands, which are very scarce, sell for about $50 per acre.

Report of Fair.—Held at Emmetsburg, September 19—22. While the weather was very favorable throughout the week in which our exhibition was held, the week previous thereto was exceptionally wet and was visited by severe storms, which discouraged a great many people from bringing exhibits, which they otherwise would have brought. However, the receipts were sufficient to pay all premiums and expenses in full and leave a surplus of $200 to be expended for improvements on our grounds.

POCAHONTAS.

R. M. HARRISON, FONDA, OCTOBER 20, 1905.

General Condition of Crops, Etc.—The season was generally favorable and all crops are good.

Corn.—The best crop for years, both in yield and quality.

Oats.—Good. Above the average both in quality and yield.

Wheat.—Small acreage but yielded a good crop.

Rye.—Excellent, both in quality and yield.

Flax.—Small acreage but yield and quality good.

Buckwheat.—Small acreage.

Millet.—Good.

Sorghum.—None raised.

Timothy.—Good.

Clover.—Good.

Prairie Hay.—Good.

Other Grains and Grasses.—Good.

Potatoes.—Fair yield and of good quality.

Vegetables.—Good.

Apples.—Heavy yield; quality excellent.

Other Fruits.—Good.

Cattle.—There are a large number of breeders of thoroughbred cattle in this county, and there is a steady improvement in the quality of cattle being raised.

Horses.—The demand for heavy horses in eastern markets, and the large prices offered keeps the number low. Horses raised here are generally well bred and the stock is improving.

Swine.—A great many raised, and are generally well bred. No disease reported.

Sheep.—Very few raised, but are generally thoroughbred.

Poultry.—Great many raised.

Bees.—Have done well.

Drainage.—Under the new law many districts have been organized and a comprehensive system of drainage is to be established. A great deal of tile is being laid.

Other Industries.—The manufacture of brick and tile is carried on successfully at Fonda and Rolfe.

Lands.—Have increased in value from five to ten dollars per acre, and considerable is changing hands.

Report of Fair.—Held at Fonda, August 8—11. The weather was fair throughout the week, but very warm. The exhibit in the live stock department was the best the association has ever had, and especially was this true in the cattle and swine divisions. All other departments were well filled with excellent exhibits. In the speed department there was a large field of the best horses in the northwest, and the races and other attractions were very satisfactory. Owing to the excessive heat, the attendance was somewhat disappointing, although it was fairly large.

POTTAWATTAMIE.

WM. THIES, AVOCA, OCTOBER 26, 1905.

General Condition of Crops and Season.—Good.

Corn.—Quality good; stand, a little thin.

Oats.—Fair yield and of excellent quality.

Wheat.—Fair yield and of good quality.

Rye.—None raised.

Barley.—Fair, both in yield and quality.

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Very little raised, but yielded a heavy crop of good quality.

Sorghum.—Is raised by only one farmer in this county; yielded a good crop the past season.

Timothy.—Good, both in quality and yield.

Clover.—Yielded a heavy crop but first cutting was badly damaged.

Prairie Hay.—Good.

Potatoes.—A larger acreage than usual was planted, which yielded a good crop.

Vegetables.—Good.

Apples.—Poor, both in quality and yield.

Other Fruits.—Fair.

Cattle.—An unusually large number on hand, and are in good condition.

Horses.—Are in good condition and command high prices.

Swine.—A great many raised, and are in a healthy condition.

Sheep.—There is an increase in the number in this county.

Poultry.—Did well.

Bees.—Did well.

Drainage.—Not much tiling being laid.

Other Industries.—There is a large canning factory which puts up a large amount of corn each year.

Lands.—Very little changing hands. Prices range from $65 to $100 per acre.

Report of Fair.—Held at Avoca, September 19—22. The weather was very favorable throughout the week and the attendance was fair.

POWESHIEK.

I. S. BAILEY, JR., GRINNELL, OCTOBER 22, 1905.

General Condition of Crops, Etc.—This section was visited the past season by a large amount of rain, accompanied by considerable lightning which did a great deal of damage to stock and buildings. Crops generally have been very good.

Corn.—Good, both in quality and yield, it being pronounced the best crop for several years. No killing frost visited this section until October 12th.

Oats.—Good. Was damaged to some extent by rain during harvest and while in shock.

Wheat.—Small acreage but yielded a good crop.

Rye.—Small acreage but yielded a good crop.

Barley.—Usually good; discolored to some extent by rains.

Flax.—None raised.

Buckwheat.—Very little sown but yielded a good crop.

Millet.—Very little sown, but yielded a fair crop.

Sorghum.—Small acreage, but yielded a fair crop.

Timothy.—Good yield but damaged to some extent by rain.

Clover.—Good yield, being the best crop we have had for several years. Was damaged to some extent by rain at cutting time.

Prairie Hay.—Small acreage but yielded a good crop.

Other Grains and Grasses.—Good.

Potatoes.—Fair. Did not yield as well as expected.

Vegetables.—Good.

Apples.—Small yield and quality poor.

Other Fruits.—Good.

Cattle.—Are in excellent condition, owing to a large amount of rain making pastures exceptionally good. Not so many being fed for market as last year.

Horses.—Are in good condition and command high prices.

Swine.—Are in good condition, with no disease of any kind reported. Farmers are providing them with pastures and not confining to small pens and one ration, which, in the writer's opinion, keeps them in a more healthy condition.

Sheep.—Owing to the high price of wool and mutton, they are one of the most profitable animals on the farm.

Poultry.—Is in good condition. Prices high for both eggs and poultry.

Bees.—Did fairly well.

Drainage.—More tile has been laid this season than any previous year, thus bringing into cultivation some of the most fertile and productive lands.

Other Industries.—Manufacturing is increasing yearly.

Lands.—Although prices are high, with good management they are made a paying investment.

Report of Fair.—Held at Grinnell, September 5—8.

POWESHIEK.

JAMES NOWAK, MALCOM, OCTOBER 30, 1905.

General Conditions of Crops and Season.—Good, with but few exceptions. No killing frost visited this section until late in October, thus giving all the crops time in which to mature.

Corn.—Quality good, and will yield on an average of forty bushels per acre. Price for new corn thirty-five cents per bushel.

Oats.—Of good quality and yielded much above the average of the past several years.

Wheat.—Small acreage, but yield and quality fair.

Rye.—Small acreage but yield and quality good.

Barley.—Fair yield of excellent quality.

Flax.—None grown.

Buckwheat.—Small acreage, but yield and quality excellent.

Millet.—Small acreage, but yielded a fair crop of good quality.

Sorghum.—Small acreage, but yielded an excellent crop.

Timothy.—Good.

Clover.—Fair yield and quality good.

Prairie Hay.—None grown.

Potatoes.—Small yield and quality fair.

Vegetables.—Good.

Apples.—Small yield and of poor quality. Prices high.

Other Fruits.—Grapes, plums, cherries, strawberries, and nearly all small fruits yielded a good crop of excellent quality.

Cattle.—Are in good condition. Prices fair. No disease reported. Not so many will be fed for market as usual.

Horses.—Good grades are scarce and command high prices. No disease reported.

Swine.—A large number raised and are in good condition. No cholera reported. Prices good.

Sheep.—Very few raised in this country, but are in good condition.

Poultry.—A great deal raised, for which good prices are being paid for shipment to eastern markets.

Bees.—Did not do well; honey scarce.

Drainage.—Land is usually well drained, and yet there is a great deal of tile being put in each year to better the condition of the ground.

Other Industries.—Manufacturing is carried on to some extent and employs about four hundred men. In the opinion of the writer, a canning factory would be profitable in this county.

Lands.—Very little changing hands. Prices range from $60 to $125 per acre.

Report of Fair.—Held at Malcom, August 22—24. Although the weather was unfavorable, (two of the heaviest rains of the season visiting this section during the days on which our fair was held), the exhibits in all departments were large and excellent. On the last day of our fair all streams in the county were out of their banks, and roads were almost impassable, which cut down the attendance about one-half; however, receipts were sufficient to pay all premiums in full.

RINGGOLD.

F. E. SHELDON, MT. AYR, SEPTEMBER 15, 1905.

General Condition of Crops, Etc.—The season was very favorable and crops generally good.

Corn.—Prospects are for the best crop since that of 1895.

Oats.—Good average yield and of excellent quality.

Wheat.—Good, both in quality and yield.

Rye.—Fair yield.

Barley.—None raised.

Flax.—None raised.

Buckwheat.—Very little raised.

Millet.—Small acreage.

Sorghum.—Very little raised.

Timothy.—Good.

Clover.—Good.

Prairie Hay.—None raised.

Potatoes.—Good, both in quality and yield.

Vegetables.—Good.

Apples.—Light crop.

Other Fruits.—Good, with the exception of peaches.

Cattle.—Are in good condition.

Horses.—Are in good condition.

Swine.—An exceptionally large increase, and are in good condition.

Sheep.—Very few raised, but are in good condition.

Poultry.—Has done exceptionally well.

Bees.—Did well.

Lands.—Prices remain about the same as last year, with some little advance.

Report of Fair.—Held at Mt. Ayr, Sept. 5-9. Owing to unfavorable weather on two days our attendance was not as large as it otherwise would have been. Exhibits in every department were up to the average of former years. and taken as a whole, the exhibition was very successful.

SHELBY

L. H. PICKARD, HARLAN, OCTOBER 16, 1905.

General Condition of Crops, etc.—Although the season was somewhat cool, crops generally have been very good.

Corn.—Above the average, both in quantity and yield.

Oats.—Of good quality and yielded above the average of former years.

Wheat.—Small acreage but yielded a fair crop.

Rye.—Small acreage but yielded a good crop.

Barley.—Fair, but somewhat discolored.

Flax.—None raised.

Buckwheat.—Small acreage but yielded a good crop.

Millet.—Shall acreage but yielded a good crop.

Sorghum.—None raised.

Timothy.—Large acreage, yielded a good crop.

Clover.—Large acreage, yielded a good crop.

Prairie Hay.—None grown.

Potatoes.—Fair.

Vegetables.—Good.

Apples.—Light crop.

Other Fruits.—Cherries yielded about half the usual crop; plums, fair; strawberries, good.

Cattle.—One of the leading industries of the county, there being over one hundred breeders of registered stock, including Shorthorns, Polled Angus and Herefords, and a few herds of Polled Durham, Red Polled, Jerseys and Holsteins.

Horses.—All breeds are well represented, and there are a great many good horses. Some good, heavy registered draft brood mares are needed.

Swine.—Have done well. There are a great many Poland China, Duroc Jerseys, Chester Whites and Berkshires raised in this county.

Sheep.—This has been a very profitable industry the past few years.

Poultry.—Has done well. There are several large breeders in this county.

Drainage.—Natural drainage is good.

Other Industries.—Manufacturing gasoline engines, automobiles, brick and tile is carried on to some extent. Also there are creameries, flour mill, and a sale pavilion in which about twenty sales of thoroughbred stock were held this year, and which is much appreciated by breeders.

Lands.—Very few farms are for sale. Prices range from $75 to $125 per acre.

Report of Fair.—Held at Harlan, Sept. 12-15. Rainy weather prevailed and we had but one day of racing.

SIOUX

DENNIS SCANLAN, ROCK VALLEY, SEPTEMBER 11, 1905.

General Condition of Crops, etc.—Although the season was a little wet from the middle of June to the first of July, and was somewhat dry from the middle of July to the forepart of August, the season as a whole was very favorable and crops generally were good.

Corn.—A larger acreage planted than last year, and a better stand was obtained. Eared well and ten days will put it all out of the way of damage by frost and it will be the best crop for several years.

Oats.—Early varieties yielded about thirty-five to fifty bushels to the acre, while late varieties yielded from forty to sixty-five; oats were of good quality.

Wheat.—Winter variety yielded from eighteen to twenty-two bushels per acre, of fair quality, while spring wheat yielded about ten bushels to the acre.

Rye.—Small acreage, but yielded a fair crop.

Barley.—Yielded from twenty to thirty bushels per acre.

Flax.—None raised.

Buckwheat.—Small acreage and did not yield very well, owing to dry weather in July and August.

Millet.—Small acreage, but yielded a fair crop.

Sorghum.—None raised.

Timothy.—Good; above an average crop.

Clover.—First cutting excellent; weather too dry for second crop, yet prospects are for a good yield of seed. There was a large acreage seeded down last spring.

Prairie Hay.—Small acreage, but yielded a good crop.

Other Grains and Grasses.—There are some small pieces of alfalfa which yielded well the past season.

Potatoes.—Early varieties good; late varieties only fair, owing to season being dry.

Vegetables.—Fair.

Apples.—Poor, both in quality and yield.

Other Fruits.—Plums, small yield; grapes, currants, raspberries and strawberries, fair.

Cattle.—Are in fair condition. Increase in number about the same as last year.

Horses.—Are in good condition. An increase over last year in the number raised and are of better quality.

Swine.—Have done well; large increase. No disease reported.

Sheep.—Have done well. The usual increase; no disease reported.

Poultry.—Is in good condition; large increase. No disease reported.

Bees.—This industry is on the increase, and the past season a good crop of honey was gathered.

Drainage.—Natural drainage is very good.

Other Industries.—Flour mills are doing a prosperous business.

Lands.—Are unexcelled in the state; very little changing hands; prices good.

Report of Fair.—Held at Rock Valley September 5-7.

SIOUX

H. SLIKKERVEER, ORANGE CITY, OCTOBER 16, 1905.

General Condition of Crops and Season.—Good.

Corn.—Will yield about forty-five bushels per acre.

Oats.—An average crop, yielded from thirty-five to forty bushels per acre.

Wheat.—Below the average, owing to the spring being too wet.

Rye.—None raised.

Barley.—Fair

Flax.—None raised.

Buckwheat.—None raised.

Millet.—Average crop.

Sorghum.—Very little raised.

Timothy.—Above the average yield.

Clover.—Good.

Prairie Hay.—Average crop.

Other Grains and Grasses.—An average with former years.

Potatoes.—Yielded about half the usual crop.

Vegetables.—Good.

Apples.—Poor, being only about thirty per cent of the usual crop

Other Fruits.—About half the usual crop.

Cattle.—Are in good condition.

Horses.—Are in good condition.

Swine.—A great deal of cholera prevalent.

Sheep.—Are in good condition.

Poultry.—Has done well.

Bees.—Did not do as well as usual.

Drainage.—Good.

Lands.—Range in price from $85 to $100 per acre, and the demand is good.

Report of Fair.—Held at Orange City, Sept. 20-22. This was the twentieth annual exhibition of the Sioux County Agricultural Society, and it was pronounced a success financially and otherwise. We were favored with good weather throughout the fair, and the attendance was large. The exhibits were very satisfactory in every department, except the swine department, which owing to a great deal of cholera in this district, caused swine men to be reluctant in exhibiting.

STORY

THEODORE P. WORSLEY, JR., NEVADA, OCTOBER 26, 1905.

General Condition of Crops, etc.—The season has been very favorable with the exception of one or two bad hail and wind storms, and crops as a whole have been very good.

Corn.—About, the, usual acreage planted, whish will yield a very good crop, although some damage was done by wind.

Oats.—Averaged about thirty-six bushels per acre, weighing thirty-two pounds to the bushel, and was of good quality.

Wheat.—Very little raised.

Rye.—Small acreage but yielded a good crop.

Barley.—Very little sown.

Flax—None grown.

Buckwheat.—Very little raised.

Millet.—Mostly sown where corn was drowned out, and yielded a fair crop.

Sorghum.—Small acreage.

Timothy.—Yielded a good crop and was put up in excellent condition.

Clover.—Fair crop.

Potatoes.—Generally poor, although some localities report a yield of over two hundred and fifty bushels to the acre.

Vegetables.—Good.

Apples.—Fair yield and of good quality.

Other Fruits.—Plums scarce; grapes good.

Cattle—The usual number are being fed for market. A great many thoroughbreds are raised.

Horses.—A great many fine thoroughbred sires are owned in this county and the best grades of horses are produced.

Swine.—Are usually well bred, and have been free from disease the past season.

Sheep.—Very few raised but did well the past season.

Poultry.—A few chicken raisers caponize their cockerels, which adds greatly to their weight and more than double the price is obtained for such fowls.

Drainage.—All ponds and sloughs are gradually being drained.

Other Industries.—Manufacturing of concrete electrical fence posts is carried on extensively, and a great many are used in this county.

Lands.—Prices high.

Report of Fair.—Held at Nevada, Sept. 12-15. The exhibits in the horse, cattle, swine and poultry departments were more than double that of any previous year. The attendance was small, owing to unfavorable weather prevailing, and our track was in poor shape for racing.

TAMA

A. G. SMITH, TOLEDO, OCTOBER 14, 1905.

General Condition of Crops, etc.—The season was very favorable and crops in general are the best for years.

Corn.—Indications are that it will be the largest crop raised for the past twenty years and is of good quality.

Oats.—Good both in quality and yield.

Wheat.—Small acreage, and that was spring variety which yielded a good crop.

Rye.—Yielded an excellent crop.

Barley.—As good, if not better, than last year.

Flax.—Very little, if any, raised.

Buckwheat.—Small acreage; yielded a good crop.

Millet.—Good.

Sorghum.—Very little raised and manufactured into syrup.

Timothy.—While the acreage was not as large as usual, owing to farmers the past few years ploughing up their meadows, yield and quality was good.

Clover.—A record breaking crop.

Prairie Hay.—Very little grown.

Other Grains and Grasses.—First class.

Potatoes.—Will yield a good crop.

Vegetables.—Fair; not as good as last year.

Apples.—Fair.

Other Fruits.—Fair.

Cattle.—Are in good condition, owing to pastures being exceptionally good. No disease reported.

Horses.—Are in fine condition, and demand is good for all classes.

Swine.—Have done well. There were over four hundred and fifty head of fine specimens on exhibit at our fair.

Sheep.—Very few raised in this county, but those shown at our fair were very good.

Poultry.—Has done well. Some very fine birds were shown at our fair.

Bees.—Very few raised or kept in this county.

Drainage.—Good.

Other Industries.—Are paper mill, flour mills, canning factories, scale works and iron works.

Lands.—Mostly black loam soil. Range in price from $50 to $150 per acre.

Report of Fair.—Held at Toledo, Sept. 26-29. The weather was the most favorable the society has ever been favored with when holding exhibitions. The horse department was well filled with as well bred animals as were ever shown at our fair, and it was quite noticeable throughout the live stock exhibit that this county is raising a much better grade of stock. The exhibit of cattle was good, there being two herds of Polled Angus and fine showing of Shorthorns. In the sheep department there were a number of pens shown. In the poultry department, while the exhibit was not as large as last year, the showing was very good. Agricultural Hall was well filled with an excellent exhibit of grains, vegetables, fruit, etc., and in the Art Hall the exhibits were excellent. The exhibition, as a whole, was a success.

UNION

CARL D. DAVENPORT, CRESTON, OCTOBER 12, 1905.

General Condition of Crops, etc.—Good, although the season was somewhat backward on account of alternating excessive wet and dry weather.

Corn.—An average crop, although many pieces will yield the best crop in years.

Oats.—Above the average yield and of good quality.

Wheat.—Good yield.

Other Small Grains.—Yielded a fair crop.

Prairie Hay.—Yielded a large and excellent crop.

Other Grasses.—Good.

Potatoes.—Plentiful.

Vegetables.—Good.

Apples.—Fair yield and of good quality.

Cattle.—A growing industry. There is one exceptionally fine herd of Herefords.

Horses.—The exhibit in this department was the largest ever had at our fair.

Swine.—Have done exceptionally well, and the exhibit at our fair was unusually large.

Sheep.—Have done well. The exhibit at our fair was small.

Poultry.—This industry is rapidly growing and is one of the most profitable of the county. The exhibit at our fair was immense.

Bees.—A small exhibit was shown at our fair.

Lands.—Soil productive. Sell readily and are increasing in price.

Report of Fair.—Held at Creston, Sept. 12-15. The weather was very unfavorable, with the exception of one day, and in consequence we are considerably behind in a financial way. There was a very large attendance on the one pleasant day, and it is the desire on the part of everyone to continue the fair.

VAN BUREN

D. A. MILLER, MILTON, SEPTEMBER 20, 1905.

General Condition of Crops, etc.—Season has been very favorable and indications are that all crops will be good.

Corn.—Large acreage planted, and indications are at this time that it will yield about seventy-five per cent of a full crop.

Oats.—Small acreage but yield and quality much better than for several years.

Wheat.—Small acreage but yielded a good crop.

Rye.—Small acreage but yielded a good crop.

Barley.—Very little raised.

Flax.—None raised.

Buckwheat.—Small acreage, but indications are that it will be a good crop.

Millet.—Large acreage and will yield a good crop.

Sorghum.—Large acreage.

Timothy.—Large acreage which yielded a small crop, and seed is poor.

Clover.—Very little raised.

Prairie Hay.—Very little raised.

Other Grains and Grasses.—Good.

Potatoes.—Large acreage planted, which will yield about twenty-five per cent less than last year.

Vegetables.—Good.

Apples.—Fall varieties yielded a good crop, while winter varieties did not do so well.

Other Fruits.—Yielded an exceptionally large crop and were of good quality.

Cattle.—A great many well bred cattle are raised in this section.

Horses.—A great many are raised, and are of good breeding.

Swine.—Increase large and are in good condition.

Sheep.—Good increase.

Poultry.—Plentiful.

Bees.—A number kept in this country.

Drainage.—Good.

Other Industries.—Manufacturers report a prosperous year.

Lands.—Command good prices.

Report of Fair.—Held at Milton, Sept. 5-8. The attendance was poor owing to rainy weather throughout the week.

WARREN

LEE TALBOTT, INDIANOLA, OCTOBER 30, 1905.

General Condition of Crops, etc.—Although the season was somewhat wet and cold, crops have done fairly well.

Corn.—In some sections of the county is good, while in other sections it is very poor, owing to its having been blown down; upon a whole, will be an average crop.

Oats.—Yielded a very good crop, but was damaged to some extent by wet weather.

Wheat.—Small acreage, but yielded a very good crop.

Rye.—Small acreage but yielded a good crop.

Barley.—Very little raised.

Buckwheat.—None raised.

Millet.—None raised.

Sorghum.—Light crop.

Timothy.—A very heavy yield and was generally put up in good condition.

Clover.—First cutting made a very heavy yield, but was damaged to some extent by rain. Second cutting was very good, and was put up in good condition.

Prairie Hay.—Very little raised in this county.

Other Grains and Grasses.—Pastures were good all the season, and especially was this true of blue grass and white clover.

Potatoes.—Early varieties yielded a fair crop, while indications are that the late varieties will yield only fairly well.

Vegetabes.—Fair.

Apples.—Very light crop; almost a failure.

Other Fruits.—Good.

Cattle.—Are extensively raised and have done unusually well the past season.

Horses.—All breeds are raised; the heavy breeds are preferable among farmers.

Swine.—All breeds are extensively raised.

Sheep.—Only a few flocks in the county.

Poultry.—Is raised extensively, and is considered a profitable industry.

Bees.—Have done well and a large amount of honey was secured.

Drainage.—A great deal of tiling is being laid.

Lands.—Generally rolling prairie land; prices range from $50 to $150 per acre.

Report of Fair.—Our exhibition was opened at Indianola on September the 12th, and if the weather had been favorable, would have been one of the most successful ever held by our society. As it was, rain fell on the opening date and continued throughout to such an extent that it was impossible to carry out the program. On Thursday, Sept. 14th, lightning struck one of our buildings, killing four persons and seriously injuring a good many others. So appalling was the disaster that the society thought best to close the fair, and no awards were made, and no premiums paid.

WAPELLO.

L. A. MEEKER, OTTUMWA, OCTOBER 16, 1905.

General Condition of Crops and Season.—The early part of the season was exceptionally wet, while the latter part was rather dry. Crops are an average with former years.

Corn.—An average crop. Some little trouble was experienced in getting a good stand.

Oats.—Scarce.

Wheat.—Very little raised.

Rye.—Fair.

Barley.—Fair.

Flax.—None raised.

Millet.—None raised.

Buckwheat.—None raised.

Sorghum.—An average crop.

Timothy.—Above the average crop, both in quality and yield.

Clover.—First cutting was not generally saved.

Prairie Hay.—None raised.

Potatoes.—Good.

Vegetables.—Plentiful.

Apples.—Fair.

Other Fruits.—Good.

Cattle.—More plentiful than last year, and are in good condition.

Horses.—A greater number raised than last year. Are in a healthy condition. Prices twenty per cent off.

Swine.—A large increase, and are in a healthy condition.

Sheep.—About the usual number raised.

Poultry.—Plentiful and is in a healthy condition.

Drainage.—Some tile is being laid.

Lands.—Very little is changing hands; prices remain the same as last year.

Report of Fair.—Held at Ottumwa, Aug. 22-25. Unfavorable weather prevailed throughout the week, consequently the attendance was very light.

WEBSTER.

M. H. HAIRE, FT. DODGE, OCTOBER 5, 1905.

General Condition of Crops, Etc.—The season has been an exceptionally favorable one for all kinds of crops. In the early part we had considerable rain, but it did no damage excepting to fruits and potatoes.

Corn.—Prospects are for the best crop in years, and will yield on an average about thirty-five bushels to the acre. The exhibit at our fair was not as large as last year, on account of the early dates on which it was held.

Oats.—Of good quality, and yielded from thirty to thirty -five bushels to the acre.

Wheat.—There has been an increase the last few years in the amount of wheat raised, and this season yielded from fifteen to twenty bushels per acre and was of good quality.

Rye.—Quality good and yielded about twenty-two bushels per acre.

Barley.—Very little grown.

Flax.—Very little grown.

Buckwheat.—Very little grown.

Millet.—None grown.

Sorghum.—None grown.

Timothy.—Yielded on an average of two tons per acre, ,and was put up in good condition.

Clover.—Yielded about two tons per acre and was put up in good condition.

Prairie Hay.—Yielded about two and one-half tons per acre, and was put up in good condition.

Other Grains and Grasses.—Good.

Potatoes.—Damaged a great deal by season being too wet.

Vegetables.—Good both in quality and quantity.

Apples.—Owing to the excessive rain fall in June, the yield was very light.

Other Fruits.—All affected to some extent by June rains.

Cattle.—Are in good condition. The exhibit at our fair was good, and included Shorthorn, Red Polled, Swiss and Jersey breeds.

Horses.—There is a noticeable increase in this industry in the country, and the breeds represented at our fair were Clydesdale, Norman, and roadsters.

Swine.—Did well. Are generally in a healthy condition. The principal breeds were represented at our fair, including Poland Chinas, Berkshires and Duroc Jerseys.

Sheep.—Very few raised or kept in the country. The breeds represented at our fair were Merino and Shropshire.

Poultry.—Did well. All the principal breeds were represented at our fair, including light and dark Brahma, Black Langshan, Buff Cochin, barred and white Plymouth Rock and brown and white Leghorns.

Bees.—Very few in this country.

Drainage.—This question is receiving a great deal of attention, and much tiling has been done the last few years.

Other Industries.—About fifteen hundred men are employed in the stucco work, the clay deposits in this county being extensive and very valuable. A company has recently been organized, with a capital stock of $1,000,000, for the manufacturing of cement. Coal is mined extensively and this industry gives employment to many hundred men. One of the largest potteries in the state is located in this county.

Lands.—Have not increased much in price during the past few years, owing to wet seasons which have prevailed, yet there has been no decrease in value. Indications are that the favorable season of this year will cause an increase. Price now ranges from $60 to $85 per acre.

Report of Rair.—Held at Ft. Dodge, Sept. 6-9. It rained the first two days, which decreased our attendance to some extent, but taking everything into consideration, the exhibition was a success.

WINNESHIEK.

H. L. COFFEN, DECORAH, OCTOBER 30, 1905.

General Condition of Crops and Season.—Excellent.

Corn.—Above the average. Large acreage planted, which will yield about fifty bushels to the acre, and of good quality.

Oats.—Yield and quality excellent.

Wheat.—Small acreage, but yielded about twenty bushels to the acre of fair quality.

Rye.—Large acreage, but yielded a fair crop.

Barley.—Large acreage, which yielded a good crop, but was discolored to some extent by rains.

Flax.—Large acreage, which yielded about fifteen bushels per acre.

Buckwheat.—Small acreage, but yielded a good crop.

Millet.—Considerable sown for hay and yielded a good crop.

Sorghum.—None plantel.

Timothy.—An exceptionally good crop.

Clover.—An exceptionally large crop.

Prairie Hay.—Very little grown.

Other Grains and Grasses.—Spelt is raised to some extent on rolling land that is quite dry, and is regarded as a good crop for feed.

Potatoes.—Quality good, but light yield. Selling for forty cents per bushel and are in good demand.

Vebetables.—Good.

Apples.—Plentiful, and early varieties were very cheap; better prices obtained for winter varieties.

Other Fruits.—Plums did not yield a very large crop, while all other small fruits were good.

Cattle.—Are in good condition and free from disease. Market low and breeders do not feel very jubilant over prospects for their sales.

Horses.—Are in good demand. Probably more than seven hundred head of good grades have been shipped from this county the past year at prices ranging from $125 to $250.

Swine.—Are in excellent condition. Nearly all breeders report having good luck with pigs.

Sheep.—A good increase was obtained; no diseasse reported. Very few are being sold.

Poultry.—Plentiful. Males sell readily at good prices, but few hens and pullets are offered, as farmers generally are holding them to increase their flock.

Bees.—Did fairly well.

Drainage.—Very little is needed, the natural drainage being good. In some parts, however, tile is being laid.

Other Industries.—Nearly every township has a creamery, which is usually operated on the cooperative plan to the satisfaction of all the patrons.

Lands.—Until recently there has been very little changing hands. Prices range from $40 to $100 per acre

Report of Fair.—Held at Decorah, Sept. 5-8. The exhibits in the horse and cattle department were much lighter than usual, while the swine department was well filled, as was also the machinery department. Much inconvenience and financial loss was caused by the amusement company which we engaged failing to keep their contract. In the opinion of the writer, it would be well for all secretaries when engaging amusements to require a bond for the fulfilment of contract. Although our speed classes did not fill very well, the races were good. As a whole, the fair was not as successful as some that we have held.

WINNEBAGO.

J. A. PETERS, FOREST CITY, OCTOBER 24, 1905.

General Condition of Crops, Etc.—The forepart of the season was somewhat below normal in temperature but the latter part was exceptionally favorable for all crops. The rainfall was about normal, and the season was from two to three weeks longer than the average.

Corn.—Considerable was drowned out on the lowlands, cutting down the acreage to some extent. Practically all corn has matured without frost, and will average about thirty-five bushels per acre.

Oats.—Averaged about thirty-five bushels, of fair quality, to the acre.

Wheat—Small acreage which yielded about fifteen bushels per acre, and was of fair quality.

Rye.—None grown.

Barley.—Averaged about twenty-two bushels per acre of good quality.

Flax.—Yielded about twelve bushels to the acre.

Buckwheat.—Small acreage, but yielded about ten bushels to the acre.

Millet.—Very little grown.

Sorghum.—Very little grown.

Timothy.—Fair; yielded about five bushels of seed per acre.

Clover.—Yielded a good crop of hay; none cut for seed.

Prairie Hay.—Yielded about two tons per acre, and was put up in excellent condition.

Potatoes.—Early varieties yielded much better than the later ones. No rot reported.

Vegetables.—Fair.

Apples.—Summer and fall varieties yielded a large crop, while there were very few winter varieties.

Other Fruits.—Small varieties of all kinds were good, especially strawberries.

Cattle.—Show considerable improvement in breeding. Very few farmers use any but registered sires. Shorthorns seem to be the favorable breed.

Horses.—Have done well. Quite a number of car load lots have been shipped out of the county the past year, for which good prices were obtained. A few imported sires have been brought in.

Swine.—Increase on an average with former years. No disease reported.

Sheep.—Very little interest is taken in this industry, but those who handle them report favorably.

Poultry.—There is a noticeable increase in the interest taken in this industry each year; the farmer's wife having the right idea that eggs will about pay the grocery bill.

Bees.—About the usual amount of honey gathered.

Drainage.—Farmers continue to put in tile, and our county board of supervisors have contracted for several ditches which will be of great value to the farm districts through which they pass. Great interest is being taken in this question.

Other Industries.—There are two canning factories located in the county, both of which can sweet corn, and which are supported by the farmers who are well pleased with the income they receive from the raising of sweet corn.

Lands.—Very little changing hands. Prices remain steady. The usual farmer is well satisfied with his farm, realizing that it is a "little gold mine".

Report of Fair.—Held at Forest City, Oct. 3-5. The weather was exceptionally favorable throughout the week, and exhibits in every department were good. The receipts were very satisfactory and all visitors seemed well pleased with the exhibition.

WINNEBAGO.

GEO. JOHNSON, BUFFALO CENTER,, OCTOBER 25, 1905.

General Conditions of Crops and Season.—Good.

Corn.—Although the stand is poor in some fields, the weather has been favorable for maturing, and indications are that the crop will be above an average.

Oats.—Average yield and of good quality.

Wheat.—Small acreage, but of fair quality and yield.

Rye.—None grown.

Barley—Small acreage but yielded an average crop.

Flax.—Small acreage, which yielded an average crop.

Buckwheat.—Average crop.

Millet—Small acreage, but yielded a fair crop.

Sorghum.—Very little grown.

Timothy.—Yielded a good quantity and was put up in excellent condition.

Clover.—Yield and quality good.

Prairie.Hay.—Good yield and was put up in excellent condition

Other Grains and Grasses.—Average crop

Potatoes.—Yielded a little below the average, but were of good quality.

Vegetables.—Good

Apples.—Of good quality and better than the average yield.

Other Fruits.—Plums and cherries yielded a light crop, but all other fruits were on an average with former years.

Cattle.—The usual number raised, and are in good condition.

Horses.—There is a noticeable improvement in the grade being raised. Demand is good and fair prices are being offered.

Swine...The usual increase. No disease reported

Sheep.—Very few flocks in this county, but the usual increase is reported.

Poultry.—Has done well. Demand and prices good.

Bees.—Have done well.

Drainage.—A number of drainage districts have been established. and a great deal of tiling is being laid.

Lands.—Range in price from $40 to $65 per acre, and values are advancing. The soil is a rich black loam from eighteen to thirty-six inches in depth, with a clay subsoil, and is adapted to the raising of all kinds of vegetables, grains, grasses, etc.

Report of Fair.—Held at Buffalo Center, September 12-14.

WORTH.

E. H. MILLER, NORTHWOOD, SEPTEMBER 25, 1905.

General Conditions of Crops, Etc.—Season has been favorable and all crops are good.

Corn.—Good, both in quality and yield.

Oats.—Yielded a good crop, but was damaged to some extent by rains while in the shock.

Wheat.—Fair.

Rye.—Very little raised.

Barley.—Yielded a fair crop but was discolored to some extent while in the shock.

Flax.—Yield and quality good.

Buckwheat.—Fair.

Sorghum.—Very little raised.

Timothy.—Good.

Clover.—Hay crop good.

Prairie Hay.—Yield and quality good.

Other Grains and Grasses.—Good.

Potatoes.—Good.

Vegetables.—Good.

Apples.—Small yield.

Other Fruits.—Good.

Cattle.—Are in good condition.

Horses.—Are in fair condition. Supply limited.

Swine.—Scarce, but are in fair condition.

Sheep.—Very few raised.

Poultry.—The usual number raised.

Bees.—Did fairly well.

Drainage.—Larg amount of ditching has been done in our county, with satisfactory results.

Other Industries.—Are in a prosperous condition.

Lands.—Are in good demand, and fair prices are obtained.

Report of Fair.—Held at Northwood, Sept. 11-13. The weather was favorable throughout the week, and the attendance was good. The exhibit of agricultural products was the best had in years.

1905—FINANCIAL STATEMENTS OF COUNTY AND DISTRICT FAIRS—1905.

Marginal number.	County or District.	Receipts.				Disbursements.						Marginal number.
		Balance on hand November 1, 1904.	Receipts for 1905.	Overdrafts for 1905.	Total receipts for 1905.	Expenses for 1905.	Speed premiums paid for 1905.	Premiums paid for 1905.	Balance on hand November 1, 1905.	Total disbursements for 1905.	Indebtedness for 1905.	
1	Adair	....	$ 3,186.57	.... ..	$ 3,186.57	$ 1,020.51	$ 1,075.00	$ 980.90	$ 110.16	$ 3,186.57	$ 1,000.00	1
2	Adams	$ 281.89	3,821.98	......	4,103.87	2,008.55	1,151.05	842.74	101.53	4,103.87	1,100.00	2
3	Allamakee	... ...	1,652.13	....	1,652.13	953.99	226.01	445.70	26.43	1,652.13	.. ...	3
4	Audubon	280.00	2,053.25	....	2,333.25	1,513.82	.	795.90	23.53	2,333.25	800.00	4
5	Benton	....	940.27	....	940.27	234.46	292.00	329.55	94.26	940.27	1,800.00	5
6	Black Hawk, La Porte City District	.. ..	1,731.21	$ 347.84	2,079.05	930.50	636.50	512.05	......	2,079.05	1,700.00	6
7	Boone	.	1,023.90	226.43	1,250.33	317.93	350.00	582.40	.....	1,250.33	1,974.26	7
8	Buena Vista	36.63	6,331.74	....	6,368.37	2,653.62	2,490.00	964.75	260.00	6,368.37		8
9	Butler	23.31	2,166.30	.. ....	2,189.61	896.06	430.00	726.10	137.45	2,189.61	813.00	9
10	Calhoun	....	1,806.00	969.93	2,775.93	1,931.64	135.00	709.29	..	2,775.93	1,600.00	10
11	Cass	.... ..	4,462.70		4,462.70	1,472.59	1,358.36	801.78	829.97	4,462.70	2,700 00	11
12	Cass-Massena District	..	3,943.10	309.03	4,252.13	3,191.13	583.00	478.00	.. ..	4,252.13	309.03	12
13	Chickasaw-Big Four District	197.89	2,821.80	778.48	3,798.17	1,475.92	1,648.00	674.25		3,798.17	3,000.00	13
14	Clayton	....	3,238 44	..	3,238.44	1,683.35	723.21	787.80	44.08	3,238.44		14
15	Clayton-Elkader District	16.75	4,050.05	219.21	4,286.01	2,041.01	1,587.25	657.75	.. .	4,286.01	4,065.00	15
16	Clayton-Strawberry Point District	27.43	3,825.80	.....	3,853.23	2,308.44	941.25	574.85	28.69	3,853.23	1,750.00	16
17	Clinton	425.63	5,689.81	....	6,115.44	2,621.63	1,764.00	1,341.00	388.81	6,115 44	2,010.00	17
18	Clinton-Clinton District	50.31	6,861.70	......	6,912.01	3,770.82	1,680 00	1,397.30	63.89	6,912.01		18
19	Davis	45.75	2,573.40	1,236.60	3,855.75	1,036.30	1,800.00	959.45	...	3,855.75	1,236.60	19
20	Delaware	15.65	3,075.11	.. ...	3,090.76	1,472.83	972.50	545.93	99.50	3,090.76	2,400.00	20
21	Fayette	11.14	3,717.70	.. .	3,728.84	2,582.39	467.25	654.20	25.00	3,728.84	200.00	21
22	Floyd	...	285.77	333.78	619.55	130.00	55.00	434.55	....	619.55	1,325.00	22
23	Franklin	70.86	2,867.71	319.78	3,258.35	1,485.45	990.00	782.90	.... .	3,258.35	2,040.00	23
24	Grundy	....	2,963.57	....	2,963.57	2,084.59	230.00	614.40	34.58	2,963 57		24
25	Guthrie	....	1,545.95	....	1,545.95	716.47	200.00	600.22	29.26	1,545.95	1,200.00	25
26	Hancock	....	1,329.86	.....	1,329.86	399.00	403.00	522.50	5.36	1,329.86	1,300.00	26
27	Hardin county	4.59	4,816.65	....	4,821.24	2,015.00	1,690.00	1,059.50	56.74	4,821.24	1,100.00	27
28	Harrison	11.67	2,808.10	....	2,819.77	673.58	1,550.00	468.75	127.49	2,819.77	436.00	28
29	Henry	271.00	5,734.46	....	6,005.46	2,388.28	2,148.00	1,244.00	225.18	6,005.46	850.00	29
30	Henry—Eastern Iowa District	38.16	3,393.14	....	3,431.30	1,107.94	1,165.00	1,067.26	91.10	3,431.30	3,600.00	30
31	Humboldt	.....	2,137.14	....	2,137.14	920.30	470.00	589.70	157.14	2,137.14	574.20	31
32	Iowa	25.58	1,791.40	... .	1,816.98	801.18	490.00	500 80	25.00	1,816.98	1,834.30	32
33	Iowa—Victor District	26.11	2,106.67	... .	2,132.78	831.50	756.25	498.50	46.53	2,132.78	800.00	33
34	Iowa—Williamsburg District	....	2,099.07	....	2,099.07	1,504.42	....	594,65	....	2,099.07	2,500.00	34

35	Jackson	129.00	7,637.25	...	7,666.25	4,290.00	1,775.00	922.55	678.70	7,666.25	3,000.00	35
36	Jasper	233.98	2,835.56	...	3,069.54	1,225.00	655.00	932.00	257.54	3,069.54	1,700.00	36
37	Jefferson	60.00	2,081.45	358.70	2,500.15	455.00	1,080.00	965.15	...	2,500.15	1,100.00	37
38	Jones	24.87	4,114.30	...	4,139.17	2,262.45	677.47	1,991.00	108.25	4,139.17	...	38
39	Jones—Anamosa District	68.54	6,349.71	...	6,418.25	3,415.46	2,170.00	709.00	123.79	6,418.25	...	39
40	Keokuk—What Cheer District	94.15	3,326.10	...	3,420.25	1,451.00	1,000.00	758.50	210.75	3,420.25	...	40
41	Kossuth	8.31	3,235.75	...	3,244.06	1,419.69	757.50	792.75	271.12	3,244.06	500.00	41
42	Lee	555.10	1,421.15	...	1,976.25	856.38	300.00	499.15	320.72	1,976.25	..	42
43	Lee—West Point District	...	2,374.05	...	2,374.05	1,053.02	772.00	524.25	21.78	2,374.05	1,800.00	43
44	Linn—Prairie Valley District	253.35	3,301.50	...	3,554.85	1,159.72	1,325.00	710.00	360.13	3,554.85	800.00	44
45	Linn—Wapsie Valley District	...	2,270.95	...	2,270.95	887.97	475.00	888.40	19.58	2,270.95	2,500.00	45
46	Louisa—Columbus Junction District	...	4,605.78	410.96	5,016.74	1,474.59	1,785.00	1,757.15	...	5,016.74	3,800.00	46
47	Louisa—Wapello District	113.25	3,421.80	124.91	3,659.96	818.66	1,895.00	946.30	...	3,659.96	2,000.00	47
48	Madison	...	1,855.83	83.16	1,938.99	592.14	952.85	394.00	..	1,938.99	1,164.00	48
49	Mahaska—New Sharon District		3,150.05	...	3,150.05	1,723.97	500.00	552.55	373.53	3,150.05	500.00	49
50	Marion—Lake Prairie District	612.67	2,690.85	...	3,303.52	632.46	469.00	752.85	1,449.21	3,303.52		50
51	Marshall—Eden District	...	2,761.35	455.23	3,216.58	2,786.58	...	430.00	...	3,216.58	455.23	51
52	Mills	239.63	718.56	516.90	1,475.09	1,025.34	...	449.75	...	1,475.09	516.90	52
53	Mitchell	37.63	2,851.92	...	2,889.55	1,735.19	389.50	525.10	239.76	2,889.55	780.00	53
54	Montgomery	132.69	5,015.50	...	5,148.19	2,197.42	2,007.50	745.20	198.07	5,148.19	2,000.00	54
55	Muscatine—Union District	16.03	5,443.25	...	5,459.28	2,070.76	1,645.00	1,442.25	301.27	5,459.28	950.00	55
56	Muscatine—Wilton District	1,000.00	2,272.21	18.79	3,291.00	1,646.00	1,100.00	545.00	...	3,291.00	.	56
57	O'Brien	...	3,187.30	...	3,187.30	1,393.97	875.00	512.10	406.23	3,187.30	1,550.00	57
58	O'Brien—Sheldon District	1,012.50	5,068.61	...	6,081.11	1,965.36	2,531.25	571.00	1,013.50	6,081.11	1,012.50	58
59	Page—Clarinda District	184.61	2,280.80	...	2,465.41	1,400.01	387.75	602.65	75.00	2,465.41	200.00	59
60	Page—Shenandoah District	912.61	6,475.00	...	7,387.61	4,155.87	1,671.50	971.75	588.49	7,387.61	...	60
61	Palo Alto	69.76	1,537.70	46.53	1,653.99	714.24	600.00	339.75	...	1,653.99	564.00	61
62	Pocahontas		4,405.57	124.00	4,529.57	1,376.82	2,450.00	702.75	...	4,529.57	1,250.00	62
63	Pottawattamie	310.19	3,694.70		4,004.89	1,666.24	1,218.00	706.90	413.75	4,004.89	1,350.00	63
64	Poweshiek—Central at Grinnell	5.85	3,707.87	975.54	4,689.26	1,549.91	2,505.00	634.35		4,689.26	3,900.00	64
65	Poweshiek—Central at Malcom	346.52	2,325.51	...	2,672.03	1,188.74	765.00	620.40	97.89	2,672.03		65
66	Ringgold	...	1,438.95		1,438.95	639.56	230.75	568.64	...	1,438.95	1,800.00	66
67	Shelby	...	2,028.35	431.00	2,459.35	1,295.50	465.00	698.85	..	2,459.35	431.00	67
68	Sioux	360.99	1,667.80		2,028.79	897.28	443.00	504.60	183.91	2,028.79	200.00	68
69	Sioux—Rock Valley District	...	1,603.77	450.13	2,053.90	439.15	1,075.00	539.75	...	2,053.90	1,500.00	69
70	Story	...	3,658.32	55.11	3,713.43	2,120.44	1,026.25	566.74	...	3,713.43	3,500.00	70
71	Tama	...	3,500.78		3,500.78	1,482.06	1,027.50	795.25	195.97	3,500.78	...	71
72	Union—Creston District	...	2,250.21	1,284.79	3,535.00	2,153.00	475.00	907.00	...	3,535.00	..	72
73	Van Buren—Milton District		1,514.00	190.66	1,704.66	456.66	913.00	335.00	...	1,704.66	1,500.00	73
74	Wapello—Ottumwa District	610.00	1,517.30	301.05	2,428.35	585.60	1,150.00	692.75	...	2,428.35	...	74
75	Webster	279.13	1,136.95	22.22	1,438.30	657.30	259.00	522.00	...	1,438.30	...	75
76	Winnebago	513.51	1,158.20	...	1,671.71	712.46	275.00	134.25	550.00	1,671.71	...	76
77	Winnebago—Buffalo Center District	114.65	957.95	...	1,072.60	610.00	205.00	229.28	28.32	1,072.60	1,000.00	77
78	Winneshiek	42.66	2,556.74	...	2,599.40	1,664.39	407.00	515.00	13.01	2,599.40	300.00	78
79	Worth	67.23	1,133.99	...	1,201.22	481.49	60.00	508.00	151.73	1,201.22	750.00	79
80	Wright		957.39	...	957.39	702.54	...	254.85	...	957.39	2,000.00	80
	Totals year of 1905—Statement	$10,269.76	$236,251.08	$10,590.76	$257,111.60	$116,712.54	$73,203.45	$55,505.93	$11,689.68	$257,111.60	$92,391.02	
	Totals year of 1904—Statement—79 Counties Reporting	5,210.64	252,022.75	7,174.78	264,408.17	114,689.38	82,175.43	54,326.08	13,217.28	264,408.17	91,325.89	
	Comparative	$ 5,059.12	$ 5,771.67	$ 3,415.98	$ 7,296.57	$ 2,023.16	$ 8,971.98	$ 1,179.85	$ 1,527.60	$ 7,296.57	$ 1,065.13	

PART XI.

Directory of Associations and Organizations Representing Agricultural Interests in Iowa

AND OTHER STATES.

Iowa State Horticultural Society.

President: W. A. Burnap, Clear Lake; Vice President, W. M. Bomberger, Harlan; Secretary, Wesley Greene, Des Moines; Treasurer, Elmer M. Reeves, Waverly.

Iowa Park and Forestry Association.

President, L. H. Pammel, Ames; Vice President, W. A. Burnap, Clear Lake; Secretary, T. H. McBride, Iowa City; Treasurer, H. F. Wickham, Iowa City.

Society of Iowa Florists.

President, G. A. Heyne, Dubuque; Vice President, Theo. Ewaldt, Davenport; Secretary, Wesley Greene, Des Moines; Treasurer, S. E. Muntz, Dubuque.

Iowa Grain Dealers Association.

President, J. A. King, Nevada; Vice President, S. B. Williams, Madrid; Secretary-Treasurer, Geo. A. Wells, Des Moines.

Iowa Corn Growers' Association.

President, Asa Turner, Farrar; Vice President, D. McArthur, Mason City; Secretary, J. W. Jones, Ames; Treasurer, L. W. Forman, Ames.

The Corn Belt Meat Producers Association.

President A. L. Ames, Buckingham; Vice President, Charles W. Macher, Fort Dodge; Secretary, H C. Wallace, Des Moines; Treasurer, Charles Goodnow, Wall Lake.

Iowa Good Roads Association.

President, Henry Harlow, Onawa; Vice President, A. C. Steel, Coon Rapids; Secretary-Treasurer, Thos. H. McDonald, Ames.

Iowa Improved Live Stock Breeders' Association.

President, E. M. Wentworth, State Center; Vice President, G. H. Burge, Mt. Vernon; Secretary-Treasurer, W. J. Rutherford, Ames.

Iowa Farmers' Co-Operative Association

President, F. N. Densmore, Mason City; Vice-President, Perry Algers, Ruthven; Secretary, C. G. Meserole, Gowrie; Treasurer, J. H. Brown, Rockwell.

Eastern Central Iowa Farmers' Institute Association.

President, Fred McCulloch, Hartwick; Vice-President, T. H. Carrothers, Ryan; Secretary-Treasurer, Robt. H. Edwards, Williamsburg.

Iowa Swine Breeders' Association.

President, W. D. McTavish, Coggon; Secretary, C. C. Carlin, Des Moines.

Iowa State Dairy Association.

President, S. B. Shilling, Mason City; Vice President, W. B. Barney, Hampton; Secretary, P. H. Keiffer, Manchester; Treasurer, F. M. Brown, Cedar Rapids.

COUNTY FARMERS' INSTITUTES IN IOWA.

ADAIR—President, A. C. Savage, Adair; Secretary, D. J. Cowden, Adair.

ADAMS—President, C. T. O'Key, Prescott; Secretary, Len Stanley, Prescott.

AUDUBON—President, H. F. Jones, Hamlin; Secretary, A. H. Edwards, Audubon.

BENTON—President, Fred McCulloch, Hartwick; Secretary, G. R. Ahrens, Belle Plaine.

BLACK HAWK—President, W. D. Strayer, Waterloo, Route No. 1; Secretary, H. R. Hollis, Hudson.

BOONE—President, B. F. Keister; Secretary, V. E. Donellson, Beaver.

BREMER—President, E. C. Bennett, Tripoli; Secretary, L. C. Oberdorf, Waverly.

BUCHANAN—President, W. H. Warburton, Independence; Secretary, W. H. Miller, Independence.

BUENA VISTA—President, C. F. Kinne, Storm Lake; Secretary, S. R. Haines, Storm Lake.

BUTLER—President, Geo. Adair, Shell Rock; Secretary, E. E. Wilcox, Shell Rock.

CALHOUN—President, W. F. Schwark, Lohrville; Secretary, Henry Parsons, Rockwell City.

CARROLL—President, Geo. Gregory, Ralston; Secretary, W. F. Steigerwalt, Carroll.

CEDAR—President, Wm. Test, West Branch; Secretary, Mrs. C. Hampton, West Branch.

CERRO GORDO—President, J. H. Brown, Rockwell; Secretary, A. M. Avery.

CHEROKEE—President, G. W. Harrison, Washta; Secretary, Victor Felter, Washta.

CHEROKEE—Secretary, Dan Phelan, Cherokee.

CHICKASAW—President, J. M. Held, Nashua; Secretary, C. L. Johnson, Nashua.

CLAY—President, Wm. Torbet, Spencer, Route No. 1; Secretary, Miss Clara Hepson, Dickens.

CLAYTON—President, M. G. Arnold, Strawberry Point; Secretary, O. K. Whitlock, Strawberry Point.

CLAYTON—President, W. H. Leonard, Elkader; Secretary, John Johnson, St. Olaf.

CLINTON—President, W. S. Dannatt, Low Moor; Secretary, Warren Walrod, Welton.

DALLAS—President, John Fox, Dallas Center; Secretary, M. J. Graham, Adel.

Decatur—President, Fred Wooley, High Point; Secretary, Wm. Snyder, Garden Grove.

Delaware—President, T. H. Carrothers, Ryan; Secretary, C. A. Clute, Manchester.

Dickinson—President, H. B. Sherk, Spirit Lake; Secretary, G. Lynn, Spirit Lake.

Dubuque—President, W. A. Fairburn, Cascade; Secretary, Fred Kurt, Cascade.

Emmet—President, W. S. Reid, Estherville; Secretary, H. W. Woods, Estherville.

Floyd—President, W. E. Gaylord, Nora Springs; Secretary, D. B Swartwood, Nora Springs.

Franklin—President, Oliver Yelland, Sheffield; Secretary, F. H. Diest, Hampton.

Fremont—President, I. P. Dixon, Sidney; Secretary, T. W. Hutchinson, Anderson.

Greene—President, Thos. Tayne, Paton; Secretary, Harry Harding, Jefferson.

Grundy—President, Wm. Mooty, Grundy Center; Secretary, Lewis Plager, Grundy Center.

Guthrie—President, Grant Chapman, Bagley; Secretary, S. J. Reed, Guthrie Center.

Hancock—President, F. J. OXLEY, Corwith. Secretary, Geo. P. Hardwick, Britt.

Hardin—President, J. B. Parmalee, Iowa Falls; Secretary, W. E. Carpenter, Iowa Falls.

Harrison—President, J. E. Jones, Missouri Valley; Secretary, Tillie Perry, Logan.

Howard—President, C. V. Johnson, Cresco; Secretary, R. M. Thomson, Cresco.

Humboldt—President, T. H. Gamble, Humboldt; Secretary, A J. Hock, Humboldt.

Ida—President, A. C. Garner; Secretary, E. G. Preston, Battle Creek.

Iowa—President, Fred Turner, North English; Secretary, F. G. Boland. Williamsburg.

Jackson—President, L. B. Parshall, Canton; Secretary, L. L. Littlefield, LaMotte.

Jasper—President, J. C. Haifleigh, Newton; Secretary, T. J. Kating, Newton.

Jefferson—President, J. P. Manatrey, Fairfield; Secretary, Chas. H. Gage, Fairfield.

Johnson—President, Andrew Crawford; Secretary, L. W. Andrews, Morse.

Keokuk—President, W. S. Chancy, Nugent; Secretary, G. E. Barnhardt, South English.

Kossuth—President, M. D. L. Parsons, Irvington; Secretary, J. B. Hofins, Algona.

Lee—President, Joseph Fry, Wever; Secretary, E. C. Lynn, Donnellson.

Linn—President, John Wilson, Walker; Secretary, Geo. Hayzlett, Walker.

Linn—President, L. J. Reed, Central City; Secretary, J, F. Wagor, Central City.

Louisa—President, James Brockway, Letts; Secretary, J. E. Gray, Columbus Junction.

Lucas—President, Frank P. Wright, Chariton; Secretary, Laura Fitch, Chariton.

Lyon—President, J. R. Skewis, Inwood; Secretary, G. M. Anderson, Inwood.

Madison—President, H. H. Hawk, Winterset; Secretary, A. M. Meachem, Winterset.

Mahaska—President, A. J. Lytle, Oskaloosa; Secretary, F. F. Everett, Oskaloosa.

Marion—President, J. H. Norris Secretary, John Scholtterback, Knoxville

MARSHALL—President, C. R. Lynch, Green Mountain; Secretary, Merrit Greene, Jr., Marshalltown.

MILLS—President, J. M. Anthony, Glenwood; Secretary, G. Hanson, Glenwood.

MITCHELL—President, R. Dorsey, Osage; Secretary, D. F. Sheehan, Osage.

MONONA—President, Will C. Whiting, Whiting.

MONROE—President, E. B. Morris, Albia; Secretary, W. A. Rowles, Albia.

MUSCATINE—President, J. I. Nichols, West Liberty; Secretary, O. W. Norton, Wilton Junction.

O'BRIEN—President, Alex McCreath, Primghar; Secretary, H. O. Smith, Primghar.

OSCEOLA—President, W. J. Reeves, Sibley; Secretary, C. W. Sollitt, Sibley.

PAGE—President, G. N. Trimble, College Springs; Secretary, E. F. Badge, College Springs.

PALO ALTO—President, B. J. Bergeson, Graettinger; Secretary, D. C. Tipp, Graettinger,

POCAHONTAS—President, J. C. Potter, Havelock; Secretary, F. K, Hawley, Laurens.

POLK—President, Frank Justice, Berwick; Secretary, Nelson Gormley, Bondurant.

POWESHIEK—President, M. D. Korns, Hartwick; Secretary, Wm. Fisher, Hartwick.

RINGGOLD—President, W. F. Sconce, Benton, Route No. 1; Secretary, Walter H. Beal, Mt. Ayr.

SAC—President, Harry Baxter, Sac City; Secretary, Mrs. R. Englehardt, Sac City.

SCOTT—President, Christ Marti, Long Grove; Secretary, Henry Lau, Mt. Joy,

SHELBY—President, H. B. Kees, Harlan; Secretary, W. M. Bomberger, Harlan.

SIOUX—President, J. C. Emery, Orange City; Secretary, Geo. A. Sheldon, Hull.

STORY—President, W. P. George, Ames; Secretary, J. M. Chrisman, Ames.

TAMA—President, J. A. McClain, Toledo; Secretary, W. B, Ebersole, Toledo.

TAMA—President, C. Lambert, Buckingham; Secretary, S. Wilson, Traer.

TAYLOR—President, James Edmunds, Lenox; Secretary, G. E. Campbell, Gravity.

UNION—President, L. J. Day, Afton, Route No. 5; Secretary, Will Boys, Creston, Route No. 2.

VAN BUREN—President, Wm. Mort, Keosauqua; Secretary, C. C. Rambo, Keosauqua.

WAPELLO—President, Lloyd D. Burton, Ottumwa; Secretary, Ralph Holman, Ottumwa.

WARREN—President, E. B. Igo, Indianola; Secretary, Don L. Berry, Indianola.

WASHINGTON—President, David McLaughlin; Secretary, A. R. Miller, Washington.

WAYNE—President, J. F. Holiday, Allerton; Secretary, J. H. Duncan, Allerton.

WINNEBAGO—President, Eugene Secor, Forest City; Secretary, J. H. Anderson, Forest City.

WINNESHIEK—President, John McMillan, Mable, Minnesota; Secretary, W. Albert Van Vliet, Prosper, Minnesota.

WORTH—President, T. L. Bolton, Northwood; Secretary, E. J. McQuatters, Northwood, Route No. 2.

WRIGHT—President, F. A. Thayer, Dows; Secretary, A. C. Fuller, Dows.

COUNTY AND DISTRICT AGRICULTURAL SOCIETIES AND FAIR ASSOCIATIONS IN IOWA.

ADAIR—Adair County Society, Greenfield; President, C. A. Gibbs; Secretary, J. E. Brooks.

ADAMS—Adams County Society, Corning; President, W. J. Drennan; Secretary, B. Newcomb.

ALLAMAKEE—Allamakee County Society, Waukon; President, S. H. Opfer; Secretary, A. C Larson.

APPANOOSE—Appanoose County Society, Centerville; President, J. A. Bradley; Secretary, H. A. Russell.

AUDUBON—Audubon County Society, Audubon; President, George W., Hoover; Secretary, C. E. Breniman.

BENTON—Benton County Society, Vinton; President, I. Mitchell; Secretary, Arad Thompson.

BLACK HAWK—LaPorte District Society, LaPorte City; President, Joseph Husman; Secretary, B. L. Manwell.

BOONE—Boone County Society, Ogden; President, C. H. Williams; Secretary, F. Lorenzen.

BUCHANAN—Buchanan County Society, Independence; President, Frank A. Orr; Secretary, Charles L. King.

BUENA VISTA—Buena Vista County Society, Alta; President, M. Adams, Secretary, C. E. Cameron.

BUTLER—Butler County Society, Allison; President, John Caster; Secretary, J. V. Gregory.

CALHOUN—Calhoun County Society, Manson; President, Thomas Griffin; Secretary, G. B. Moon.

CASS Cass County Society, Atlantic; President, F. C. Schain; Secretary C. S. Brown.

CASS—Massena District Society, Massena; President, S. D. Wyckoff; Secretary, D. P. Hogan.

CARROLL—Carroll Fair and Driving Park Association, Carroll; President, N. Beiter; Secretary, George Selzer.

CEDAR—Tipton Fair Association, Tipton; President, L. J. Rowell; Secretary, H. Piatt.

CHICKASAW—Big Four Association, Nashua; President, W. A. Granger; Secretary, G. C. Hoyer.

CLAYTON—Clayton County Society, National, President, Joseph Mott; Secretary, H. Luehsen, Jr.

CLAYTON—Strawberry Point District Society, Strawberry Point; President, G. F. Wheeley; Secretary, J. P. Howard

CLAYTON—Elkader Fair and Track Association, Elkader; President, Joseph Lamm; Secretary, J. A. Kramer.

CLINTON—Clinton County Society, DeWitt; President, D. Armentrout; Secretary, P. Butterfuss.

CLINTON—Clinton District Society, Clinton; President, John L. Wilson; Sacretary, J. B. Ahrens.

DAVIS—Davis County Society, Bloomfield; President, O. W. Wisdom; Secretary, J. C. Brouhard.

DELEWARE—Delaware County Society, Manchester; President, Ben Sheldon; Secretary, J. J. Pentony.

FAYETTE—Fayette County Society, West Union; President, Joseph Smith; Secretary, H. P. Hancock.

FLOYD—Floyd County Society, Charles City; President, W. E. Waller; Secretary, C. M. Carr.

FRANKLIN—Franklin County Society, Hampton; President, C. F. Roemer; Secretary, J. W. Cummings.

GRUNDY—Grundy County Society, Grundy Center; President, H. C. Plager; Secretary, E. G. Ensminger.

GUTHRIE—Guthrie County Society, Guthrie Center; President, J. G. Thomas; Secretary, A. H. Grissell.

HANCOCK—Hancock County Society, Britt; President, F. B. Rogers; Secretary, John Hammill.

HARDIN—Hardin County Society, Eldora; President. R. B. Link; Secretary, H. S. Martin.

HARRISON—Harrison County Society, Missouri Valley; President, E. F. James; Secretary, W. H. Withrow.

HENRY—Henry County Society, Mount Pleasant; President, F. F. Campbell; Secretary, C. M. Clark.

HENRY—Eastern Iowa District Society, Winfield; President, A. W. Shearer; Secretary, Theodore Russell.

HUMBOLDT—Humboldt County Society, Humboldt; President, L. C. Trauger; Secretary, John Cunningham.

IOWA—Victor District Society, Victor; President, Charles Raffensperger; Secretary, J. P. Bowling.

Iowa—Williamsburg Fair Association, Williamsburg; President, Millard Harrington; Secretary, Charles Fletcher.

JACKSON—Jackson County Society, Maquoketa; President, Joseph Dostal; Secretary, B. D. Ely.

JASPER—Jasper County Society, Newton; President, Louie Aillud; Secretary, E. E. Lambert.

JEFFERSON—Jefferson County Society, Fairfield; President, J. P. Manatrey; Secretary, R. C Sayers.

JOHNSON—Johnson County Society, Iowa City; President, Robert Graham; Secretary, George Hitchcock.

JONES—Jones County Society, Monticello; President, A. Mathieson; Secretary, J. J. Locher.

JONES—Anamosa Fair Association, Anamosa; President, Clifford L. Niles; Secretary, J. E. Remley.

KEOKUK—What Cheer District Society, What Cheer; President, James Stephenson; Secretary, George A. Doff.

KOSSUTH—Kossuth County Society, Algona; President, J. M. Farley; Secretary, T. H. Wadsworth.

LEE—Lee County Society—Donnellson; President, John Haffner; Secretary, Christopher Haffner.

LEE—West Point District Society West Point; President, J. R. Frailey; Secretary, C. L. Reebler.

LINN—Wapsie Valley Fair Association, Central City; President, D. E. Hedges; Secretary, E. E. Henderson.

LINN—Prairie Valley Fair Association, Fairfax; Henry Lefebure; Secretary, E. Heaton.

LINN—Marion Inter-State Fair Association, Marion; President, F. H. Wieneke; Secretary, J. B. Travis.

LOUISA—Louisa County Society, Wapello; President, M. L. Jamison; Secretary, C. M. Donaldson.

LOUISA—Columbus Junction District Society, Columbus Junction; President, O. P. Wilcox; Secretary, N. T. Hendrix.

MADISON—Madison County Society, Winterset; President. A. D. Guy; Secretary, J H. Dow.

MAHASKA—Mahaska County Society, Oskaloosa; President, C. B. McCulloch; Secretary, J. H. Harrison.

MAHASKA—New Sharon District Society, New Sharon; President, Sidney Harper; Secretary, T. R. Osborne.

MARION—Lake Prairie District Society, Pella; President, T. D. Tice; Secretary, J. H. Stubenrauch.

MARSHALL—Eden District Society, Rhodes; President, H. G. Buck; Secretary, H. F. Stouffer

MILLS—Mills County Society, Malvern; President W, R. Johnson; Secretary J. T. Ward.

MITCHELL—Mitchell County Society, Osage; President, R. Dorsey; Secretary, W. H. Gable.

MONONA—Monona County Society, Onawa; President, George O. Holbrook; Secretary, A. W. Burgess

Montgomery—Montgomery County Society, Red Oak; President, Henry Peterson; Secretary, E. A. Larson.

Muscatine—Union District Society, West Liberty; President, W. P. Nichols; Secretary, W. H. Shipman.

Muscatine—Wilton Fair Association, Wilton Junction; President, W. G. Griffith; Secretary, Dr. W. A. Cooling.

O'Brien—O'Brien County Society, Sutherland; President, S. B. Crosser; Secretary, R. C Jordan.

O'Brien—Sheldon District Society, Sheldon; President, E. E. Springer; Secretary, J. L. McLaury.

Page—Clarinda Fair Association, Clarinda; President, Ed. Davison; Secretary, W. A. Henderson.

Page—Shenandoah Fair Association, Shenandoah; President, Charles Aldrich; Secretary, James A. Swallow.

Palo Alto—Palo Alto County Fair and Racing Association, Emmetsburg; President, W. S. Parnham; Secretary, P. V. Hand.

Pocahontas—Big Four District Society, Fonda; President, R. F. Beswick; Secretary, R M. Harrison

Pottawattamie—Pottawattamie County Society, Avoca; President, F. G. Hetzel; Secretary, Roscoe Barton

Poweshiek—Central at Malcom, Malcom; President, Wm. McClure; Secretary, James Nowak.

Poweshiek—Central at Grinnell, Grinnell; President, Samuel Jacob; Secretary, I. S. Bailey, Jr.

Ringgold—Ringgold County Society, Mount Ayr; President, D. B. Marshall; Secretary, Thomas Campbell.

Sac—Sac County Society, Sac City; President, Philip Schaller; Secretary, S. M. Lewis.

Shelby—Shelby County Society, Harlan; President, B. McCord; Secretary, L. H. Pickard.

Sioux—Sioux County Society, Orange City; President, A. VanderMeide; Secretary, A. Slikkerveer.

Sioux—Rock Valley District Society, Rock Valley; President, E. S. Thayer; Secretary, Dennis Scanlan.

Story—Story County Society, Nevada; President, R. A. Frazier; Secretary, F. H. Greenwalt.

Tama—Tama County Society, Toledo; President, A. B. Toplin; Secretary, A. G. Smith.

Taylor—Taylor County Society, Bedford; President, John J. Clark; Secretary, John J. Laws.

Union—Creston District Society, Creston; President, N. D. Merrill; Secretary, Carl Davenport.

VanBuren—Milton District Society, Milton; President, Dr. L. E. Summers; Secretary, D. A. Miller.

Wapello—Eldon District Society, Eldon; President, Dr. D. A. Gay; Secretary, W. O. Bagley.

Warren—Warren County Society, Indianola; President, C. C. Reynolds; Secretary, Lee Talbott.

Wayne—Lineville District Society, Lineville; President, W. B. Wasson; Secretary, G. T. Wright,

Wayne—Seymour District Society, Seymour; President, L. C. Young; Secretary, R. E. Lowrey.

Winnebago—Forest City Park and Fair Association, Forest City; President, T. Jacobs; Secretary, J. A. Peters.

Winnebago—Buffalo Center District and Driving Park Association, Buffalo Center; President, C. G. Pritchard; Secretary, J. P. Boyd.

Winneshiek—Winneshiek County Society, Decorah; President, G. F. Baker; Secretary, L. L. Cadwell.

Worth—Worth County Society, Northwood; President, Nels Thomson; Secretary, E. H. Miller.

Wright—Wright County Society, Clarion; President, F. L. Dow -Secretary G. L. Cutler.

AGRICULTURAL EXPERIMENT STATIONS OF THE UNITED STATES, THEIR LOCATIONS, AND PRINCIPAL LINES OF WORK.

Stations, locations, and directors.	Principal lines of work.
Alabama (College), Auburn: J. F. Duggar..........	Botany; soils; analyses of fertilizers and food materials; agronomy; horticulture; plant breeding; diseases of plants and animals; animal husbandry; dairying.
Alabama (Canebrake), Uniontown: J. M. Richeson [a]......	Agronomy; horticulture; floriculture; diseases of plants and animals.
Alabama (Tuskegee), Institute: G. W. Carver	Agronomy; horticulture; diseases of plants; animal industry; dairying.
Arizona, Tucson: R. H. Forbes..........	Chemistry; botany: agronomy; horticulture; animal husbandry; dairying; irrigation.
Arkansas, Fayetteville: W. G. Vincenheller...	Chemistry: agronomy; horticulture; plant breeding; diseases of plants and animals; animal husbandry; entomology.
California, Berkeley: E. W. Hilgard.........	Chemistry; soils; bacteriology; fertilizer control: agronomy; horticulture including viticulture and zymology: botany; meteorology; animal husbandry; entomology; dairying; poultry experiments; drainage and irrigation; sylviculture; reclamation of alkali lands; animal and plant pathology; nutrition investigations.
Colorado, Fort Collins: L. G. Carpenter	Chemistry; meteorology; agronomy; horticulture; plant breeding: diseases of plants; animal husbandry; entomology; irrigation.
Connecticut, (State), New Haven: E. H. Jenkins.........	Chemistry; inspection of fertilizers, foods, feeding stuffs, Babcock test apparatus, and nurseries; diseases of plants; horticulture; forestry; agronomy; entomology.
Connecticut, (Storrs), Storrs: L. A. Clinton.........	Food and nutrition of man and animals; dairy bacteriology; agronomy; horticulture; poultry culture; dairying.
Delaware, Newark: A. T. Neale	Chemistry bacteriology; agronomy; horticulture; plant breeding; diseases of plants and animals; animal husbandry; entomology; dairying.
Florida, Lake City: Andrew Sledd..	Chemistry; agronomy; horticulture; feeding experiments; veterinary science; entomology.
Georgia, Experiment: R. J. Redding.........	Agronomy; horticulture; entomology; animal husbandry; dairying.
Idaho, Moscow: H. T. French.........	Chemistry; physics; botany; agronomy; horticulture; plant breeding; entomology; animal husbandry.
Illinois, Urbana: E. Davenport.... ...	Chemistry; bacteriology; agronomy; horticulture; forestry plant breeding; diseases of plants and animals; animal husbandry; entomology; dairying.
Indiana, Lafayette: Arthur Goss.....	Chemistry; agronomy; horticulture; animal husbandry; diseases of plants and animals; entomology; irrigation; dairying.
Iowa, Ames: C. F. Curtiss..........	Chemistry; botany; agronomy; horticultnre; plant breeding; forestry; diseases of plants; animal husbandry; entomology; dairying; rural engineering; good roads invesitgations.

[a] Assistant director.

Agricultural experiment stations of the United States, their locations, directors, and principal lines of work—CONTINUED.

Stations, locations and directors.	Principal lines of work.
Kansas, Manhattan: J. T. Willard..........	Soils; horticulture; plant breeding; agronomy; animal husbandry; diseases of animals; entomology; dairying; extermination of prairie dogs and gophers
Kentucky, Lexington: M. A. Scovell ...	Chemistry; soils; inspection of fertilizers, foods, feeding stuffs, orchards, and nurseries; agronomy; horticulture; plant breeding; animal husbandry; diseases of plants; entomology; dairying.
Louisiana (Sugar), New Orleans: W. R. Dodson...	Chemistry; bacteriology; soils; agronomy; horticulture; sugar making; drainage; irrigation.
Louisiana (State), Baton Rouge: W. R. Dodson........	Geology; botany; bacteriology; soils; inspection of fertilizers and paris green; agronomy; horticulture; animal husbandry; diseases of animals; entomology.
Louisiana (North, Calhoun: W. R. Dodson	Chemistry; soils; fertilizers; agronomy; horticulture; animal husbandry; stock raising; dairying.
Maine, Orono: C. D. Woods	Chemistry; botany; inspection of fertilizers, commercial feeding stuffs, and creamery glassware; horticulture; plant breeding; diseases of plants and animals; food and nutrition of man and animals; poultry raising; entomology; dairying.
Maryland, College Park: H. J. Patterson.	Chemistry; agronomy; horticulture; diseases of plants and animals; breeding of plants; animal husbandry; entomology; dairying.
Massachusetts,-Amherst: H. H. Goodell ...	Chemistry; meteorolgy; inspection of fertilizers; commercial feeding stuffs, creamery glassware, and nurseries; agronomy; horticulture; diseases of plants and animals; animal husbandry; entomology effect of electricity on plant growth.
Michigan. Agricultural College: C. D. Smith	Chemistry; bacteriology; soils; agronomy; horticulture; plant breeding; diseases of plants and animals; animal husbandry; entomology; stable hygiene.
Minnesota, St. Anthony-Park, St. Paul. W. M. Liggett	Chemistry; fertilizers; agronomy; horticulture; forestry; diseases of plants and animals; food and nutrition investigations; plant and animal breeding; animal husbandry; entomology; dairying; farm management; farm statistics.
Mississippi. Agricultural College: W. L. Hutchinson...	Soils; fertilizers; agronomy; horticulture; animal husbandry; diseases of animals; poultry culture; entomology; dairying.
Missouri (College) Columbia: F. B. Mumford *a*	Chemistry; botany; agronomy; horticulture; diseases of plants and animals; animal husbandry; plant breeding; entomology; dairying; drainage and irrigation.
Missouri (Fruit) Mountain Grove: Paul Evans...........	Horticulture; entomology; inspection of orchards and nurseries.
Montana, Bozeman: F. B. Linfield..........	Chemistry; meteorology; botany; agronomy; horticulture; animal husbandry; poultry experiments; entomology; dairying; irrigation.

[a] Acting director.

Agricultural experiment stations of the United States, their locations, directors and principal lines of work—CONTINUED.

Stations, locations and directors.	Principal lines of work.
Nebraska, Lincoln: E. A. Burnett	Chemistry; botany; meteorology; soils; agronomy; horticulture; diseases of plants and animals; forestry; animal husbandry; entomology; dairying; irrigation extermination of prairie dogs
Nevada, Reno: J. E. Stubbs	Chemistry; botany; soils; agronomy; horticulture; forestry; animal diseases; entomology; irrigation.
New Hampshire, Durham: W. D. Gibbs	Chemistry; agronomy; horticulture; forestry; animal husbandry; entomology; dairying.
New Jersey (State), New Brunswick: E. B. Voorhees New Jersey (College), New Brunswick: E. B. Voorhees	Chemistry; oyster culture; botany; analysis of fertilizers, foods, and commercial feeding stuffs; agronomy; horticulture; plant breeding; diseases of plants and animals; entomology; dairy husbandry; soil bacteriology; irrigation.
New Mexico, Mesilla Park: Luther Foster	Chemistry; botany; agronomy; horticulture; animal husbandry; entomology; irrigation.
New York (State), Geneva: W. H. Jordan	Chemistry; bacteriology; meteorology; inspection of creamery glassware; feeding stuffs; fertilizers; and Paris green; agronomy; horticulture; plant breeding; diseases of plants; animal husbandry; poultry experiments; entomology; dairying; irrigation.
New York (Cornell), Ithaca: L. H. Bailey	Chemistry; fertilizers; agronomy; horticulture; diseases of plants and animals; animal husbandry; poultry experiments; entomology; dairying.
North Carolina, Raleigh: B. W. Kilgore	Chemistry; soils; agronomy; horticulture; animal husbandry; diseases of animals and plants; poultry experiments; dairying; tests of farm machinery.
North Dakota, Agricultural College J. H. Worst	Chemistry; botany; agronomy; plant breeding; horticulture; diseases of plants and animals; food analysis; animal husbandry; dairying; farm mechanics.
Ohio, Wooster: C. E. Thorne	Agronomy; horticulture; plant breeding; diseases of plants and animals; animal husbandry; entomology.
Oklahoma, Stillwater: John Fields	Chemistry; agronomy; horticulture; plant breeding; forestry; botany; diseases of plants and animals; animal husbandry; entomology.
Oregon, Corvallis: J. Withycombe	Chemistry; bacteriology; agronomy; horticulture; plant selection; diseases of plants; animal husbandry; entomology; dairying; irrigation.
Pennsylvania, State College: H. P. Armsby	Chemistry; meteorology; analysis of fertilizers, foods, and feeding stuffs; horticulture; agronomy; animal husbandry; dairying.
Rhode Island, Kingston: H. J. Wheeler	Chemistry; meteorology; soils; inspection of fertilizers and feeding stuffs; agronomy; horticulture; plant breeding; poultry experiments.
South Carolina, Clemson College P. H. Mell	Chemistry; inspection of fertilizers; botany; agronomy; horticulture; plant breeding; diseases of plants; animal husbandry; veterinary science; entomology; dairying.

Agricultural experiment stations of the United States, their locations, directors and principal lines of work—CONTINUED.

Stations, locations and directors.	Principal lines of work
South Dakota, Brookings: J. W. Wilson	Chemistry; botany; agronomy; horticulture; plant breeding; diseases of plants and animals; animal husbandry; entomology; irrigation.
Tennessee, Knoxville: H. A. Morgan.........	Chemistry; inspection of fertilizers; agronomy; horticulture; plant breeding; seeds; weeds; diseases of plants; animal husbandry; entomology; dairying.
Texas, College Station: J. A. Craig..........	Chemistry; soils; agronomy; horticulture; animal husbandry; diseases of animals; irrigation.
Utah, Logan: J. A. Widtsoe........	Chemistry; alkali soil investigations; agronomy; horticulture; diseases of plants; animal husbandry; dairying; poultry experiments; entomology; irrigation.
Vermont, Burlington: J. L. Hills..............	Chemistry; botany; inspection of fertilizers, feeding stuffs, and creamery glassware; agronomy; horticulture; diseases of plants; animal husbandry; dairying.
Virginia, Blacksburg: A. M. Soule...........	Chemistry; geology; biology; agronomy; horticulture; bacteriology; analysis of foods and soils; feeding experiments; veterinary science; entomology; cider and vinegar making; ferments.
Washington, Pullman: E. A. Bryan..........	Chemistry; botany; bacteriology; agronomy; horticulture; plant breeding; diseases of plants and animals; animal husbandry; entomology; dairying; irrigation.
West Virginia, Morgantown: J. H. Stewart.........	Chemistry; inspection of fertilizers, orchards, and nurseries; agronomy; horticulture; diseases of plants; animal husbandry; poultry experiments; entomology.
Wisconsin, Madison: W. A. Henry...........	Chemistry; bacteriology; soils; agronomy; horticulture; animal husbandry; dairying; drainage and irrigation; farm engineering.
Wyoming, Laramie: B. C. Buffum..........	Botany; meteorology; soils; range improvement; fertilizers; agronomy; food analysis: animal husbandry; irrigation.

OFFICIALS IN CHARGE OF FARMERS' INSTITUTES.

BY

Farmers' Institute Specialist, Department of Agriculture

John Hamilton, Washington, District of Columbia.

State superintendents.

States and Territories.	Name of Official.	Post-office.
Alabama	C. A. Cary, Alabama Polytechnic Institute	Auburn.
	G. W. Carver, Director Agricultural Experiment Station	Tuskeego Institute.
Alaska	C. C. Georgeson, Agricultural Experiment Station	Sitka.
Arizona	R. H. Forbes, Director Agricultual Experiment Station	Tucson.
Arkansas	H. S. Hartzog, President University of Arkansas	Fayetteville.
California	E. J. Wickson, University of California	Berkeley.
Colorado.	A. M. Hawley, Secretary State Board of Agriculture	Fort Collins.
Connecticut	J. F. Brown, Secretary State Board of Agriculture	N. Stonington.
	J. O. Noble, Secretary Connecticut Dairymen's Association	Hartford.
	H. C. C. Miles, Secretary Connecticut Pomological Society.	Milford.
Delaware	Wesley Webb, Director of Farmers' Institute	Dover.
Florida	C. M. Conner, University of Florida	Lake City.
Georgia	H. C. White, President State College of Agriculture	Athens.
	Harvie Jordon, Director of Farmers' Institutes	Monticello.
Hawaii.	J. G. Smith, Agricultural Experiment Station	Honolulu.
Idaho	H. T. French, Director Agricultural Experiment Station	Moscow.
Illinois	A. B. Hostetter, Secretary Farmers' Institutes	Springfield.
Indiana	W. C. Latta, Purdue University	Lafayette.
Iowa	J. C. Simpson, Secretary State Board of Agriculture	Des Moines.
Kansas	J. T. Willard, Director Agricultural Experiment Station	Manhattan.
Kentucky	Hubert Vreeland, Commissioner of Agriculture	Frankfort
Louisiana	J. G. Lee, Commissioner of Agriculture	Baton Rouge.
Maine	A. W. Gilman, Commissioner of Agriculture	Augusta.
Maryland	W. L. Amoss, Director Farmers' Institutes	Benson.
Massachusetts.	J. L. Ellsworth, Secretary State Board of Agriculture	Boston.
Michigan	L. R. Taft, Director Farmers' Institutes	Agricultural College.
Minnesota.	O. C. Gregg, Director Farmers' Institutes	Lynd.
Mississippi	J. C. Hardy, President Agricultural and Mechanical College	Agriclutural College.
Missouri	Geo. B. Ellis, Secretary State Board of Agriculture	Columbia.
Montana.	F. B. Linfield, Director Agricultural Experiment Station	Bozeman.
Nebraska.	E. A. Burnett, Director Agricultural Experiment Station	Lincoln.
Nevada	J. E. Stubbs, President Nevada State University	Reno.
NewHampshire	N. J. Bachelder, Secretary State Board of Agriculture	Concord.
New Jersey.	Franklin Dye, Secretary State Board of Agriculture	Trenton.
New Mexico	Luther Foster, President Agricultural and Mechanical College	Mesilla Park.
New York.	F. E. Dawley, Director of Farmers' Institutes	Fayetteville.

Officials in Charge of Farmers' Institutes.—CONTINUED.

States and Territories.	Name of Official.	Post-office.
North Carolina.	S. L. Patterson, Commissioner of Agriculture	Raleigh.
North Dakota..	E. E. Kaufman, Director Farmers' Institutes	Bismarck.
Ohio	W. W. Miller, Secretary State Board of Agriculture	Columbus.
Oklahoma.	J. B Thoburn, Secretary Board of Agriculture	Guthrie.
Oregon	J. Withycombe, Director Agricultural Experiment Station	Corvallis.
Pennsylvania..	A. L Martin, Deputy Secretary of Agriculture	Harrisburg.
Porto Rico.	W. H. Elliott, Director of Farmers' Institutes	San Juan.
Rhode Island	John G. Clarke, Secretary State Board of Agriculture	Providence.
South Carolina.	J. S. Newman, Director Farmers' Institutes	Clemson College.
	Thos. E. Miller, President A. and M. College	Orangeburg.
South Dakota..	James W. Wilson, Director Agricultural Experiment Station	Brookings.
Tennessee	W. W. Ogilvie, Commissioner of Agriculture	Nashville.
Texas	J. W. Carson, Director Farmers' Institutes	College Station.
Utah	John A. Widtsoe, Director Agricultural Experiment Station	Logan.
Vermont.	Geo. Aitken, Secretary State Board of Agriculture	Woodstock.
Virginia.	G. W. Koiner, Commissioner of Agriculture	Richmond.
Washington	E. A. Bryan, President Agricultural College	Pullman.
West Virginia..	J. B. Garvin, Director of Institutes	Charleston.
Wisconsin.	G. McKerrow, Director Farmer's Institutes	Madison.
Wyoming.	B. C. Buffum, Director Agricultural Experiment Station	Laramie.

AMERICAN ASSOCIATION OF FARMERS' INSTITUTE WORKERS.

President, J C. Hardy, president Mississippi Agricultural and Mechanical College, Agricultural College, Miss.· vice-president, E. A. Burnett,-director Agricultural Experiment Station, Lincoln, Nebr,; secretary treasurer, G. C. Creelman, president Ontario Agricultural College, Guelph, Ontario.

STATE OFFICIALS IN CHARGE OF AGRICULTURE.[a]

Commissioners of Agriculture.

States and Territories.	Name of Official.	Post-office.
Alabama	R. R. Poole	Montgomery.
Arkansas	H. T. Bradford	Little Rock.
Florida	B. E. McLin	Tallahassee.
Georgia	O. B. Stevens	Atlanta.
Idaho	Robert Bell	Boise.
Kentucky	Hubert Vreeland	Frankfort.
Louisiana	J G. Lee	Baton Rouge.
Maine	A. W. Gilman	Augusta.
Montana	J. A. Ferguson	Helena.
New York	Chas. A Wieting	Albany.
North Carolina	S. L. Patterson	Raleigh.
North Dakota	W. C Gilbreath	Bismark.
New Mexico	J. W. Reynolds. Secretary of State	Santa Fe.
Pennsylvania	N. B. Critchfield. Secretary of Agriculture	Harrisburg.
Philippine Isl.	W. C. Welborn, Chief Bur. of Agriculture	Manila.
Porto Rico	Wm. H. Elliott, Commissioner of Interior	San Juan.
Tennessee	W. W. Ogilvie	Nashville.
Texas	W. J. Clay	Austin.
Virginia	Geo. W. Koiner	Richmond.
Washington	A. W. Frater, Deputy Secretary of State	Olympia.

Secretary of State Boards of Agriculture

States and Territories.	Name of Official.	Post-office.
California	Harry Lowden, Acting Secretary	Sacramento.
Colorado	A. M. Hawley	Fort Collins
Connecticut	J F. Brown	North Stonington
Delaware	Wesley Webb	Dover.
Hawaii	C. S. Holloway	Honolulu.
Illinois	W. C. Garrard	Springfield.
Indiana	Chas. Downing	Indianapolis.
Iowa	J. C. Simpson	Des Moines.
Kansas	F. D. Coburn	Topeka.
Maryland.	Wm. T. P. Turpin, Supt. of Immigration	Centerville.
Massachusetts	J. L. Ellsworth	Boston.
Michigan	Addison M. Brown	Agricult'l College.
Minnesota	E. W. Randall, Sec. State Ag'l Society	Hamline.
Missouri	George B Ellis	Columbia.
Nebraska	Robt W. Furnas	Brownville.
Nevada	Louis Bevier	Carson City.
New Hampshire	N. J Bachelder	Concord.
New Jersey	Franklin Dye	Trenton.
North Carolina	T. K Bruner	Raleigh.
Ohio	W W. Miller	Columbus.
Oklahoma	J. B. Thoburn	Guthrie.
Oregon	M. D. Wisdom	Portland.
Rhode Island	John G. Clarke	Providence.
South Dakota	Walter B. Dean	Yankton.
Vermont	C. J. Bell	East Hardwick.
West Virginia	J. O. Thompson	Charleston.
Wisconsin	John M. True	Madison.
Wyoming	C. T. Johnston, State Engineer	Cheyenne.

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[a] Officials of Territories and island dependencies are included. So far as learned, Arizona, Mississippi, New Mexico, South Carolina, and Utah have no state official charged with agricultural interests, but letters addressed to the Secretary of State would probably receive attention.

NATIONAL LIVE STOCK ASSOCIATION.

President, F. J. Hagenbarth, Salt Lake City; secretary, Fred B. Johnson, Denver.

NATIONAL WOOL GROWERS' ASSOCIATION.

President, Francis E. Warren, Cheyenne Wyo.; secretary, Mortimer Levering, Chicago, Ill.

STOCK BREEDERS' ASSOCIATIONS.[a]

Names and addresses of stock association secretaries, with breed and numbers of registered live stock in United States, December 31, 1904.

CATTLE.

Breed.	Secretary.	Postoffice.	Number registered.		Number living.	
			Male.	Female.	Male.	Female.
Aberdeen Angus..	Thos. McFarlane.... ...	Union Stock Yards, Chicago, Ill	33,372	42,472	24,200	30,800
Ayrshire	C M. Winslow.	Brandon, Vt.	9,168	19,763	3,000	9,000
Devon	L. P. Sisson ...	Newark, Ohio...	7,816	13,472	4,000	8,500
Dutch Belted ...	H. B. Richards..	Easton, Pa..	532	1,208	(b)	(b)
Galloway	C W. Gray	Union Stock Yards, Chicago, Ill	9,581	15,969	7,169	5,690
Guernsey..........	Wm. H. Caldwell	Peterboro, N. H.	9,836	18,216	6,000	12,000
Hereford	C. R. Thomas. ..	225 W. 12th st., Kansas City, Mo. .	c 201,290		c 100,000	
Holstein Friesian.	Frederick L Houghton ...	Brattleboro, Vt ..	88,180	42,682	(b)	(b)
Jersey ......,..... ..	J. J. Hemingway	8 W. 17th st., New York, N. Y.	69,267	186,297	(b)	(b)
Polled Durham..	Fletcher S Hines...... ...	Indianapolis, Ind	4,878	5,885	2,926	3,528
Red Polled.......	H. A. Martin.	Gotham, Wis......	13,650	26,716	(b)	(b)
Shorthorn	John W. Groves.	Union Stock Yards, Chicago, Ill...	231,405	366,425	77,100	165,000
Sussex....	Overton Lea . .	Nashville, Tenn...	70	172	40	85
Swiss Brown	C. D Nixon...	Owego, N. Y.	2,007	2,879	1,338	1,919

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[a] Under the provisions of paragraph 473 of the act of July 24, 1897, amended March 3, 1903, any animal imported especially for breeding purposes shall be admitted free, provided that no such animal shall be admitted free unless pure bred, of a recognized breed, and duly resistered in the book of record established for that breed. The Secretary of the Treasury, upon the advice of the Secretary of Agriculture, issued April 24, 1903, regulations for the importation of animals under this law, and designated the recognized breeds and the books of record established for these breeds.

[b] No data.

[c] Total of males and females.

Names and addresses of stock association secretaries, with breeds and number of registered live stock in United States, December 31, 1904—CONTINUED.

HORSES.

Breed.	Secretary.	Postoffice.	Number registered.		Number living.	
			Male	Fem'l	Male	Fem'l
Cleveland Bay.	R. P. Stericker	80 Chestnut ave., W. Orange, N. J.	1,205	470	1,000	400
Clydesdale	R. B. Ogilvie.	Union Stock Yds., Chicago, Ill	*b* 11,000		(*a*)	(*a*)
Coach, German	J. Crouch	Lafayette, Ind.	1,126	141	*b* 1,000	
Coach, German (Oldenburg).	C. E. Stubbs	Fairfield, Iowa	*c* 217	*c* 27	(*a*)	(*a*)
Draft, Belgian	J. D. Connor, Jr.	Wabash, Ind.	1,787	227	1,786	227
Draft, French	C. E. Stubbs	Fairfield Iowa	8,393	4,557	*b* 5,000	
Hackney	A. H. Godfrey	Box 111, Madison Square, New York City.	726	1,542	684	1,4 6
Morgan.	H. T. Cutts.	Middlebury, Vt	*c* 5,021	2,800	3,765	2,110
Percheron	Geo. W. Stubblefield.	Union Stock Yds., Chicago, Ill.	540	460	18,540	11,460
Percheron	Charles C. Glenn	Columbus, Ohio	295	17	290	13
Saddle Horse, American.	I. B. Nall.	Louisville, Ky.	*e* 2,359	3,247	1,200	1,500
Shetland Pony	Mortimer Levering.	Lafayette, Ind	1,777	3,555	1,600	2,500
Shire	Charles Burgess	Wenona, Ill	5,663	2,007	(*a*)	(*a*)
Suffolk	Alex Galbraith	Jamesville, Wis.	147	66	100	50
Thoroughbred.	James E. Wheeler.*d*	173 Fifth ave., New York, N. Y.	*b* 42,000		*b* 25,000	
Trotter, American	Wm. H. Knight	Ellsworth Bldg., 355 Dearborn st., Chicago, Ill.	*c* 40,200	*c* 104300	26,800	69,533
Jacks and Jennies	[illegible]	Columbus, Tenn	800	600	(*a*)	(*a*)

SHEEP.

Breed.	Secretary.	Postoffice.	Number registered.		Number living.	
			Male	Fem'l	Male	Fem'l
Cheviot	F. E. Dawley	Fayetteville, N. Y.	*b* 10,332		*b* 3,000	
Cotswold	F. W. Harding	Waukesha, Wis	*b* 32,705		*b* 12,000	
Dorset Horn.	J. E. Wing.	Mechanicsburg, Ohio.	1,134	3,100	850	2 325
Hampshire Down.	Comfort A. Tyler	Nottawa, Mich	4,900	11 501	(*a*)	(*a*)
Leicester	A. J. Temple	Cameron, Ill.	3,135	4,944	2,633	4,153
Lincoln	Bert Smith	Charlotte, Mich.	5,500	7,140	4,000	5,000
Merino (Delaine)	H. G. McDowell.	Canton, Ohio	*b* 9,000		*b* 7,000	
Merino (Delaine)	George A. Henry	R. F. D. 8, Bellefontaine, Ohio	8,000	12,000	3,000	7,000
Merino (Delaine)	J. B. Johnson	248 W Pike st., Canonsburg, Pa,	6,674	11,324	1,500	5,000
Merino (French).	Dwight Lincoln.	Milford Center, Ohio	*b* 27,834		*c* 8,000	*c* 12,000
Merino (German).	E. M. Moore	Orchard Lake, Mich	112	140	50	130
Merino (Spanish).	E. N. Ball	Ann Arbor, Mich	13,750	41,250	1,000	9,000
Merino (Spanish).	J. H. Earll	Skaneateles, N. Y.	*b* 19,625		*b* 2,100	
Merino (Spanish).	J. P. Ray	R. F. D. 3, East Bloomfield, N. Y.	(*a*)	(*a*)	50	150
Merino (Spanish).	C. A. Chapman	Middlebury, Vt	*b* 219,066		(*a*)	(*a*)
Oxford Down	W. A. Shafor.	Hamilton, Ohio	*b* 32,798		(*a*)	(*a*)
Shropshire.	Mortimer Levering.	Lafayette, Ind	50,000	158,000	15,000	45,000
Southdown	F. S. Springer	Springfield, Ill	*b* 18,690		*b* 9,345	
Suffolk	George W. Franklin.	Des Moines, Iowa.	*b* 905		*b* 500	

a No data.
b Total of males and females.
c Estimate for 1903.
d Register.
e Includes geldings.

Names of addresses of stock association secretaries, with breeds and numbers of registered live stock in United States, December 31, 1904—CONTINUED.

HOGS.

Breed.	Secretary	Post-office.	Number Registered Male.	Number Registered Fem'l	Number Living Mal	Number Living Fem'l
Berkshire	Frank S. Springer	510 Monroe st., Springfield, Ill.	a80,920		a30,000	
Cheshire	Ed S. Hill	Freeville, N. Y.	1,200	2,088	300	600
Chester White	Ernest Freigau	Columbus, Ohio	a11,911		b489	a1,307
Chester Ohio Improved	J. C. Hiles	40 Sheriff St., Cleveland, Ohio	a9 688		a5,800	
Duroc Jersey	T. B. Pearson	Thorntown, Ind	7,074	16,310	(d)	(d)
Duroc Jersey.	Robert J. Evans	Peoria, Ill.	16,750	41,000	4,187	10,250
Hampshire (Thin Rind)	E. C. Stone	Armstrong, Ill.	218	454	95	310
Poland China	W. M. McFadden	Union Stock Yards Chicago, Ill.	46,407	116,484	20,000	50,000
Poland China	A. M. Brown	Dayton, Ohio	31,259	70,000	9,000	21,000
Poland China	Geo. F. Woodworth	Maryville, Mo.	35,838	85,052	5,364	12,677
Poland China	H. P. Wilson	Gadsden, Tenn	609	904	500	650
Tamworth	E. N. Ball	Ann Arbor, Mich.	a1,949		a1,200	
Yorkshire Large Improved.	H. G Krum	Whitebear Lake, Minn.	2,457	3,079	20,000	2,60

a Total of males and females *b* Estimate for 1903. *d* No data.

SANITARY OFFICERS IN CHARGE OF LIVE STOCK INTERESTS.

State and Territory.	Name and Post-office.	Official position.
Alabama.	C. A. Cary, Auburn	Professor of veterinary science.
Arizona.	J. D. Carter, Prescott	Secretary live stock sanitary commission.
	J. C. Norton, Phœnix	Veterinarian
Arkansas.	R. R. Dinwiddie, Fayetteville	State veterinarian
California	Chas. Keane, Sacramento	State veterinarian.
Colorado.	L. B. Sylvester, Denver	President State board of stock inspection.
	Charles D. Lamb, Denver	State veterinary surgeon.
Connecticut.	Heman O. Averill, Hartford	Commissioner of domestic animals.
Delaware	Alex. Lowber, Wilmington	Secretary State board of health.
	H P Eves, Newark	Instructor in veterinary science, Delaware College.
Florida	Chas. F. Dawson, Lake City.	State veterinarian.
Georgia	O. B. Stevens, Atlanta	Commissioner of agriculture.
Idaho	George E. Noble, Boise	State veterinarian
Illinois	H E. Wadsworth, Springfield.	Secretary board of live stock commissioners.
	C P. Lovejoy, Princeton	State veterinarian.
Indiana	A W. Bitting, Lafayette	State veterinarian.
Iowa	Paul O. Koto, Forest City.	State veterinarian.
Kansas	John D. Baker, Peabody	Secretary live stock sanitary commission.
Kentucky	J. N. McCormack, Bowling Green	Secretary State board of health.
	F. T. Eisenman, Louisville	State veterinarian.
Louisiana	W. H. Dalrymple, Baton Rouge	Veterinarian State experiment station.
Maine	F. O. Beal, Bangor	State cattle commissioner
Maryland	G. Allen Jarman, Chestertown	Chief veterinary inspector.
	Wade H. D. Warfield, Baltimore	Secretary live stock sanitary board.
Massachusetts.	Austin Peters, Boston	Chief of cattle bureau of State board of agriculture
	F. C. Wells, Saline	State veterinarian
Michigan	H. H. Hinds, Stanton	President State live stock sanitary commission
Minnesota.	M. H. Reynolds, St. Anthony Park.	Veterinarian live stock sanitary board.

Sanitary officers in charge of live stock interests.

States and Territories.	Name and Post-office.	Official Position.
Mississippi	M. H. Bracken, St. Paul	Secretary State board of health.
Missouri	J. C Roberts. Agricultural College.	Professor of veterinary science.
	D. F. Luckey, Columbia	State veterinarian.
Montana	Geo. B. Ellis, Columbia	Secretary State board of agricultural.
	W. G. Preuitt, Helena	Secretary live stock commission.
Nebraska	M. E. Knowles, Helena	State veterinarian.
Nevada	W A. Thomas, Lincoln.	State veterinarian.
New Hampshire	S. L Lee, Carson City	Secretary State board of health.
	Irving A. Watson, Concord	Secretary State board of health
New Jersey	N. J. Bachelder, Concord	Secretary board of cattle commissioners.
	Henry Mitchell, Trenton	Secretary State board of health.
	Franklin Dye, Trenton.	Secretary tuberculosis commission.
New Mexico	W. C. Barnes, Las Vegas	Secretary cattle sanitary board
	Harry F. Lee, Albuquerque	Secretary sheep sanitary board
New York	C. A. Wieting, Cobleskill	Commissioner department of agriculture.
North Carolina	W. H. Kelly, Albany	Chief veterinarian.
	Tait Butler, Raleigh	State veterinarian.
North Dakota	S. L. Patterson, Raleigh	Commission of agriculture.
Ohio	L. Van Es, Fargo	Chief State veterinarian.
	W. W. Miller, Columbus	Secretary State board of agriculture.
Oklahoma	Paul Fischer, Columbus.	State veterinarian.
	Thomas Morris, Guthrie.	Secretary live stock sanitary commission.
Oregon	L. D. Brown, Guthrie	Territorial veterinarian.
Pennsylvania.	Wm. McLean, Portland	State veterinarian.
Rhode Island	Leonard Pearson, Philadelphia	State veterinarian.
	John G. Clarke, Providence	Secretary State board of agriculture.
	John S. Pollard, Providence	Veterinarian, State board of agriculture.
South Carolina	Louis A. Klein, Clemson College	State veterinarian.
South Dakota.	J. P. Foster, Huron	State veterinarian.
Tennessee	R. H. Kittrell, Murfreesboro	State live stock commissioner.
Texas	M. M. Hankins, Quanah	Live stock sanitary commissioner.
Utah	T. B. Beatty, Salt Lake City.	Secretary State board of health
Vermont	Victor I. Spear, Randolph	Secretary cattle commission.
Virginia	J. G. Ferneyhough, Blacksburg	State veterinarian.
Washington.	S. B. Nelson, Pullman	State veterinarian
West Virginia	J. O. Thompson, Charleston	Secretary board of agriculture.
Wisconsin	Evan D. Roberts, Janesville	State veterinarian.
	George Wylie, Morrisonville	Secretary State sanitary board
Wyoming	Geo. T. Seabury, Cheyenne.	State veterinarian.
	George S. Walker, Cheyenne	Secretary State board of sheep commissioners.

NATIONAL GOOD ROADS ASSOCIATION.

President, W. H. Moore; secretary, R. W. Richardson; treasurer, C. H. Huttig. General office, Laclede Building, St. Louis, Missouri.

FARMERS' NATIONAL CONGRESS.

President, Harvie Jordan, Monticello, Ga.; first vice president B. Cameron, Stagville, N. C.; second vice-president, Joshua Strange, Marion, Ind.; treasurer, A. H. Judy, Greenville, Ohio; secretary, John M. Stahl, 4328 Langley avenue, Chicago, Ill; first assistant secretary, George M. Whittaker, Boston, Mass.; second assistant secretary, A. C. Fuller, Dows, Iowa; third assistant secretary, Luther H. Tucker, Albany, N. Y.; executive committee, W. M. Ames, Oregon, Wis.; E. W. Wickey, Ocean Springs, Miss.; Lev Morrison, Greenville, Pa.

PATRONS OF HUSBANDRY.

OFFICERS OF NATIONAL GRANGE.

Master, Aron Jones, South bend, Ind.; overseer, T. C. Atkeson, Morgantown, W. Va.; lecturer, N. J. Bachelder, Concord, N. H. treasurer, Mrs. E. S McDowell, Rome, N. Y.; secretary, C. M. Freeman, Tippecanoe City, Ohio; executive committee, E. B. Norris, Sodus, N.Y.; C. J. Bell, East Hardwick, Vt.; F. A. Derthick, Mantua, Ohio; Aaron Jones, ex-officio, South Bend, Ind.

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